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On Differential Galvanometers, by Louis Schwendler.

(Continued from page 152, Vol. XLI, Part II, 1872.*)

The first part of this investigation concluded with the following question:

What general condition must be fulfilled in the construction of any differential galvanometer in order to make a simultaneous maximum possible with respect to an alteration of external resistance in either of the differential branches?

To answer this question, it will be necessary to remember, that the condition of a simultaneous maximum sensitiveness at or near balance was expressed by 3 equations, namely,—

$$\frac{(w-g) (w'+g') + f(w+w'+g'-g)}{p (g-w) g'} = \frac{2 (g+w+f)}{2 \sqrt{g} \sqrt{g'-p} (g+w)} \dots \text{ II}$$

$$\frac{(w'-g') (w+g) + f(w+w'+g-g')}{p} = \frac{2 (g'+w'+f)}{2 \sqrt{g} \sqrt{g'} - \frac{g'+w'}{p}} \dots \dots \text{ II}'$$

and

g and g' being the resistances of the two differential coils, w and w' the two resistances at which balance actually arrives, f the total resistance in the battery branch, and p an absolute number expressing what was termed the

Read before the Asiatic Society of Bengal, 6th March, 1872.

"mechanical arrangement" of the differential galvanometer under consideration.

By these three equations, which are independent of each other, g, g' and p can be expressed in terms of w, w' and f.

By equation I we have at or very near balance:

$$p = \frac{g' + w'}{g + w} \cdot \frac{\sqrt{g}}{\sqrt{g'}}$$
 which value substituted in equations II and II'

gives :

$$\frac{(w-g)(w'+g')+f(w+w'+g'-g)}{(g'+w')(g-w)g'} = \frac{2(g+w+f)}{(g'-w')(g+w)} \dots \text{ II}$$

and

$$\frac{(w'-g')(w+g)+f(w+w'+g-g')}{(g+w)(g'-w')g} = \frac{2(g'+w'+f)}{(g-w)(g'+w')} \dots \dots \Pi'$$

and from these two equations g and g' may be developed.

This is best done by subtracting equation II from equation II' when after reduction we get:—

$$(w'g - wg')(w'g + wg' + gg' + ww') = -f(g + g' + w + w')(w'g - wg')$$
III

Now it must be remembered, that with respect to our physical problem, f, w, w', g and g' represent nothing else, but electrical resistances, and that they have, therefore, to be taken in any formula as quantities of the same sign (say positive).

Consequently the above equation III would contain a mathematical impossibility (a positive quantity equal to a negative quantity), whenever the common factor w'g-wg' is different from zero.

In other words equation III can only be fulfilled if we always have:

$$w'g - wg' = 0$$
 IV

This simple relation between the resistances at which balance arrives and the resistances of the two differential coils, expresses not only the necessary and sufficient condition under which a simultaneous maximum sensitiveness can exist, but it also affords an easy means of getting at once those special values of g, g' and p, which only solve the physical problem.

Substituting the value of either g or g', as given by equation IV in equations II and II' and developing g and g' we have:

*
$$g = -\frac{1}{3}\left(w + f\frac{(w + w')}{2w'}\right) + \frac{2}{3}\sqrt{w^3 + \frac{w}{w'}(w + w')f + \frac{(w + w')^3}{16w'^3}f^3}.a.$$

$$^{\bullet}g = -\frac{1}{3}\left(w' + f\frac{(w+w')}{2w}\right) + \frac{2}{3}\sqrt{w'^2 + \frac{\Phi'}{w}(w+w')f + \frac{(w+w')^2}{16w^3}f^3}.b.$$

the negative signs of the square roots having been omitted since they would

obviously make g and g' negative, values which cannot solve the physical question.—

Further, if we introduce the ratio

 $\frac{g'}{g} = \frac{w'}{w}$, given by equation IV, into equation I, and develope p we get :

$$p^2 = \frac{w}{m}$$

This latter expression shows the very simple relation which must exist between the *mechanical arrangement* of *any* differential galvanometer and the two resistances at which balance is arrived at, in order to make a simultaneous maximum sensitiveness possible.

Thus if the ratio of the two resistances at which balance arrives is fixed, the mechanical arrangement p cannot be chosen arbitrarily, but must be identical with this ratio. This is in fact the answer to the question put at the beginning of this paper.

However, the meaning of this result will be made even still clearer if we revert to equation I, by which we have

$$p\frac{\sqrt{g'}}{\sqrt{g}} = \frac{g' + w'}{g + w} = C \qquad ... \qquad I$$

expressing the ratio between the total resistances in the two differential branches, when balance is established, and which ratio is generally known under the name Constant of the Differential Galvanometer.

Substituting in the above expression I the value of $\frac{g'}{g} = \frac{w'}{w}$ from equation IV we get at once

and as a second answer to the question put at the beginning of this paper we have therefore:

A simultaneous maximum sensitiveness with respect to an alteration of external resistance in either branch of any differential galvanometer can be obtained only, if the constant of the differential galvanometer is equal to the ratio of the two resistances at which balance arrives, and this clearly necessitates that the resistances of the respective coils to which w and w' belong should stand in the same ratio.

The general problem may now be considered as solved by the following four general expressions:

$$g = -\frac{1}{3} \left(w + f \frac{(\dot{w} + w')}{2w'} \right) + \frac{2}{3} \sqrt{w^2 + \frac{w}{w'} (w + w') f + \frac{(w + w')^2}{16w'^2} f^2} \dots$$

$$g' = \frac{w'}{w} g \dots$$

$$b.$$

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No. 1,

Additional remarks.

In the foregoing it has not been shewn that the values g and g', expressed by equations a and b, must necessarily correspond to a maximum sensitiveness of the differential galvanometer, because it was clear a priori, that the function by which the deflection is expressed is of such a nature that no minimum with respect to g and g' is possible. However, to complete the solution mathematically, the following is a very short proof that the values of g and g' really do correspond to a maximum sensitiveness of the differential galvanometer under consideration.

Reverting to one of the expressions for the deflection a° which any differential galvanometer gives before balance is arrived at, we had:

 $a^{\circ} \propto K \frac{\sqrt{g}}{N} \Delta$ and as the increase of deflection at or near balance is

identical with the deflection itself, and further as the law which binds the resistance of the differential coils to the other resistances in the circuit, in order to have a maximum sensitiveness, is of practical interest only when the needle is at, or very nearly at, balance, we can solve the question at once by making a° a maximum with respect to g and g', if we only suppose Δ constant and small enough, and as K is known to be independent of g and g',

the deflection a^o will be a maximum if $\frac{\sqrt{g}}{N}$ is a maximum for any constant Δ (zero included).

Further we know that g' = Cg which value for g' in N substituted will make the latter a function of g only and consequently $\frac{\sqrt{g}}{N}$ also. We have therefore to deal with a single maximum or minimum, and according to well-known rules we have:

$$\frac{da}{dg} = \frac{N - 2g \frac{dN}{dg}}{2\sqrt{g} N^3} = \frac{U}{V}$$

and

$$\frac{d^3a}{dg^3} = \frac{V \frac{d U}{dg} - U \frac{d V}{dg}}{V^2}$$

but

$$\frac{da}{dg} = 0 \quad \text{it follows that} \quad U = 0$$

$$\therefore \qquad \frac{d^2a}{dg^2} = \frac{1}{V} \frac{dU}{dg}$$

Now

$$\frac{d\mathbf{U}}{dg} = -\left(\frac{d\mathbf{N}}{dg} + 2g\frac{d^2\mathbf{N}}{dg^2}\right), \text{ but } \frac{d\mathbf{N}}{dg} \text{ as well as } \frac{d^2\mathbf{N}}{dg^2} \text{ being invariably}$$

positive, it follows that $\frac{d\mathbf{U}}{dg}$ is invariably negative, and as further V is always positive it follows finally that $\frac{d^2u}{dg^2}$ is always negative, or the value of g ob-

tained by equation $\frac{da}{dy} = 0$ corresponds to a maximum sensitiveness of the differential galvanometer.

In a similar way it can be shewn that the value of g' obtained by equation $\frac{da}{dg'} = 0$ corresponds also to a maximum sensitiveness of the differential galvanometer.

This is in fact a second and far more simple solution of the problem. However, it is by no means as general, nor does it adhere as closely to the spirit of analysis as the first more complicated solution.

Effect of Shunts.—It is clear that the introduction of shunts cannot alter the general results as given in equations a, b, c, and d, as long as the shunts are used merely for the purpose of carrying off a fixed quantity of current without in themselves having any direct magnetic action on the needle.

However, to avoid misunderstanding, it is well to remember that in the case of shunts being used, the values to be given to w and w' in the above equations are *not* those at which balance actually arrives, but those at which balance would arrive if no shunts were used, i. e., the resistance at which balance is established when using shunts must be multiplied by the multiplying, power of their respective shunts, before they are to be substituted in the equations a, b, c and d.

Mechanical arrangement designed by p.—The condition which must be fulfilled in the construction of any differential galvanometer to make a simultaneous maximum sensitiveness possible was expressed by

while $p = \frac{m' n'}{m n}$ and it will be now instructive to enquire what special physical meaning equation c has.

By m was understood the magnetic effect of an average convolution (i. e. one of average size and mean distance from the magnet acted upon, when the latter is parallel with the plane of the convolutions) in the differential coil of resistance g, when a current of unit strength passes through it. Similarly m' was the magnetic effect of an average convolution in the other differential coil of resistance g'.

Further n and n' were quantities expressed by

$$U = n \sqrt{g}$$

$$U' = n' \sqrt{g'}$$

U and U' being the number of convolutions in the two coils g and g' respectively.

Now we will call A half the cross section of the coil g (cut through the coil normal to the direction of the convolutions) and which section, as the wire is to be supposed uniformly coiled, must be uniform throughout.

Thus we have generally

$$\frac{A}{c(q+\delta)} = U$$

wherever the normal cut through the coil is taken.

c is a constant indicating the manner of coiling, either by dividing the cross-section A into squares, hexagons or in any other way, but always supposing that however the coiling of the wire may have been done, it has been done uniformly throughout the coil. (This supposition is quite sufficiently nearly fulfilled in practice because the coiling should always be executed with the greatest possible care, and further the wire can be supposed practically of equal thickness throughout the coil).

q is the metallic section of the wire, and δ the non-metallic section due to the necessary insulating covering of the wire.

Further we have

g= U $\frac{b}{q\lambda}$ where b is the length of an average convolution and λ the absolute conductivity of the wire material supposed to be a constant for the coil.

• Now, for brevity's sake, we will suppose that δ , the cross-section of the insulating covering, can be neglected against q the metallic cross-section of the wire.

Consequently we have

$$\frac{A}{cq} = U \text{ (approximately)}$$

$$g = U \frac{b}{q\lambda}$$

$$\therefore U = \sqrt{\frac{A\lambda}{bc}} \cdot \sqrt{s}$$

and

or
$$n = \sqrt{\frac{\overline{A}\lambda}{bc}}$$

similarly $n' = \sqrt{\frac{\overline{A'\lambda'}}{b'c'}}$
 $\therefore \frac{n'}{n} = \sqrt{\frac{\overline{A'\lambda'}bc}{\overline{A}\lambda b'c'}}$

But using wire of the same conductivity in both the differential coils, which should be as high as is possible to procure it, and further supposing the manner of coiling to be identical in both coils, we have

$$\lambda = \lambda'$$

$$\therefore \frac{n'}{n} = \sqrt{\frac{\overline{\Lambda'} \cdot \overline{b}}{\overline{h'}}}$$

Further we know that if the shape and dimensions of each coil are given, and in addition also their distance from the magnet acted upon, it will be always possible to calculate m and m', though it may often present mathematical difficulties, especially if the forms of the two coils differ from each other and are also not circular. This latter condition is generally necessitated in order to obtain the greatest absolute magnetic action of each coil in as small a space as possible.

However it is clear that we may assume generally that the two coils have each an average convolution of identical shape and of the same length, placed at an equal distance from the magnet acted upon, and that therefore the magnetic action of each coil is dependent on the number of convolutions only.

In this case we have evidently

$$m = m'$$

$$b = b'$$

$$\frac{n'}{n} = \sqrt{\frac{A'}{A}}$$

and as $p = \frac{n}{n} \cdot \frac{m}{m}$

we have finally

Equation e shows at once that under the supposed conditions, i. e., when the average convolutions in each coil are of equal size and shape, the wire used in either coil is of the same absolute conductivity, and that the thickness of the insulating material can be neglected against the diameter of the wire:

The wire used for filling each coil must be invariably of the same diameter, otherwise a maximum sensitiveness is impossible.

How the above simple law expressed by equation e would be altered, when the given suppositions were not fulfilled, must be found by further calculation, but as the latter is intricate and a more general result is not required in practice, I shall dispense at present with this labour.

Special Differential Galvanometers.—Here shall be given the special expressions to which the general equations a, b, c and d, are reduced when certain conditions are presupposed.

1st case.—When w and w', the two resistances at which balance is arrived at are so large that f, the resistance of the testing battery can be neglected against either of them without perceptible error. Substituting therefore f = 0 in equations a, and b, we get:

and the other two remain as they are namely:

$$p^{s} = \frac{w'}{w} \qquad c.$$

$$C = \frac{w'}{w} \qquad d.$$

2nd case.—When the battery resistance f cannot be neglected against either w or w', but when the two resistances at which balance is arrived at are invariably equal.

Thus substituting in the general equation

$$w = w' = w$$

we get

$$g = g' = g = -\frac{w+f}{3} + \frac{1}{3}\sqrt{4 w^2 + 8 f w + f^2} \qquad a, b.$$

$$p^2 = 1 \qquad c.$$

$$C = 1 \qquad d.$$

3rd Case. - When the conditions given under 1 and 2 are both fulfilled

or w = w' = wand f = 0then we have

The very same result which was obtained by direct reasoning at the beginning of this paper.

Applications.—Though the problem in its generality has now been entirely solved, it will not perhaps be considered irrelevant to add here some applications.

For our purpose differential galvanometers may be conveniently divided into two classes, viz., those in which the resistances to be measured vary within narrow limits, and those where these limits are extremely wide.

To the first class belong the differential galvanometers which are used for indicating temperature by the variation of the resistance of a metallic wire, exposed to the temperature to be measured. As for instance, C. W. Siemen's Resistance Thermometer for measuring comparatively low temperatures, or his Electric Pyrometer for measuring the high temperature in furnaces.

It is clear that for such instruments the law of maximum sensitiveness should best be fulfilled for the average resistance to be measured, which average resistance under given circumstances is always known.

To the second class belong those differential galvanometers which are used for testing Telegraph lines, at present the most important application of these instruments. In this case each differential coil should consist of separate coils connected with a commutator in such a manner that it is convenient to alter the resistance of each coil according to circumstances, i. c., connecting all the separate coils in each differential coil parallel, when the resistances to be measured are comparatively low, and all the separate coils consecutively, if the resistances to be measured are high. &c., &c., fulfilling in each case the law of maximum sensitiveness for certain resistances, which are to be determined under different circumstances differently, but always bearing in mind that it is more desirable to fulfil the law of maximum sensitiveness for high resistances, when the testing current in itself is obviously weak, than for the low resistances.

An example will show this clearer. Say for instance a differential galvanometer has to be constructed for measuring resistances between 1 and 10,000. A Siemen's comparison box of the usual kind $\left(\frac{1}{10,000}\right)$ being at disposal, it will be convenient and practical to decide that the two differential coils should be of equal magnetic momentum, from which it follows that C as well as p must be unity, or in other words that the two coils must be of equal size, shape and distance from the needle, and must also have equal resistances, i, e, must be filled with copper wire of the same diameter. The resistance of each coil is then found by

$$y = \frac{w+f}{3} + \frac{1}{3} \sqrt{1 \cdot w^2 + 8 f w + f^3}$$

where f is the resistance of the battery and w a certain value between

1 and 10,000, the two limits of measurement. The question now remains to determine w.

It is clear that the law of maximum sensitiveness has not to be fulfilled for either limit, because they represent only one of the 10,000 different resistances which have to be measured, but it is also clear that to fulfil the law for the average of the two given limits would be equally wrong, inasmuch as the maximum sensitiveness is far more required towards the highest than the lowest limit. We may assume, therefore, that it is desirable to fulfil the law for the average of the average and the highest limit, which gives

$$w = 7500$$

against which the resistance of the battery may always be neglected.

Consequently we have

$$g = \frac{w}{3} = 2500$$

for each coil.

Now if the coil be small, and consequently the wire to be used for filling it is thin, the value g = 2500 wants a correction to make allowance for the thickness of the insulating material, by which g becomes somewhat smaller.*

Before concluding I may remark that the question of the best resistance of the coil, when the resistance to be measured varies between two fixed or variable limits, can be solved mathematically by the application of the Variation Calculus.

* These expressions for g and g' must be corrected, if the thickness of the insulating covering of the wire cannot be neglected against its diameter. The formula by which this correction can be made was given by me in the Philosophical Magazine, January, 1866, namely

corrected
$$g = c g \left(1 - 4 \sqrt{g m^2}\right)$$

where g = the resistance to be corrected and expressed in Siemen's Units,

and
$$m = \delta^4 \sqrt{\frac{c \pi \lambda}{AB}}$$

8 = radial thickness of the insulating covering expressed in millimetres.

• c = a co-efficient expressing the arrangement adopted for filling the available space uniformly with wire. Namely, if we suppose that the cross section of the coil, by filling it up with wire, is divided into squares we have c = 1, if in hexagons c = 3.4. &c., &c.

 $\lambda =$ absolute conductivity of the wire material (II g = 1 at freezing point).

A = half the section of the coil in question when cut normal to the direction of the convolutions, and always expressed in square millimetres.

B = length of an average convolution in the coil, and expressed in metres.

ON THE LAND-SHELLS OF PENANG ISLAND, WITH DESCRIPTIONS OF THE ANIMALS AND ANATOMICAL NOTES; part second,* Helicacea,—by Dr. F. Stoliczka.

[Read and received 7th August, 1872.]

(With plates I to III.)

In this group of pulmoniferous land-shells I shall notice twenty three species, belonging to the Zonitidæ, Helicidæ, Bulimidæ, Clausiliidæ, Philomycidæ, Pupidæ, Streptaxidæ, Veronicellidæ and Vaginulidæ. The majority of the species are new, except a few previously described from the neighbouring country, and on one or two of such commonly distributed species, as are Stenogyra gracilis or Ennea bicolor.

Nearly all the species had been collected with the animals living, and I have spared no pains in order to make the detailed anatomical account as complete, as it appears desirable for a correct generic determination.

I scarcely need to mention, that on the whole the fauna is characteristically Malayan, the same fauna which extends from the Philippine islands through Burma and Arakan into the warm valleys of Sikkim. In the plains of Bengal it mixes with the Indian fauna proper.

I cannot help repeating the urgent request to my conchological friends in India, that they may favour me with live specimens of the species of shells occurring in their neighbourhood. In the *Helicacea* especially, the anatomical characters are indispensable for a correct generic determination, and without this it will not be possible to obtain a natural arrangement of our terrestrial Mollusca.

Fam. Zonitidæ.

RHYSOTA† CYMATIUM, (Benson). Pl. i, figs. 1-3 and pl. ii, figs. 13-15.

Helix Cymatium, Benson, apud Pfeisser, Novit. Conch. I, p. 58, pl. xvii, figs. 1-2.

Penang specimens, which slightly differ in the height of the spire, (see figs. 1-3, pl. i,) agree in almost every point of structure with the type shell, described by Pfeiffer from Lancavi, a small island situated a few miles north of Penang. The increase of the volutions is in both exactly the same, the upper side of the whorls is marked with fine oblique rugosities, the lower is spirally striated; in fresh specimens the former is silky brown, the lower olivaceous brown, the inside of the aperture is in full grown specimens cover-

- * Continued from J. A. S. B., for 1872. Vol. XLI, pt. ii, p. 271.
- † Albers, Heliceen, edit. E. v. Martens, p. 54.

ed with a kind of a nacreous callose layer. The only noticeable difference consists in the narrowness of the umbilicus, its width being in all the Penang specimens, which I obtained, about one twelfth of the diameter of the shell, while in Benson's type it is only one seventh of the same diameter.

The species is found all over Penang hill from elevations of about 300 to 2500 feet, and both on the ground as well as on trees, but chiefly on the latter; it is, however, not common, and adult shells are indeed extreme rarities.

The closely allied Rh. densa, (Adams).* only differs by a slightly smaller number of whorls, the last being much wider. Rh. Chevalieri, (Souleyet), differs in the same character, though it has the umbilious of exactly the same size as the Penang variety of cymatium.

The animal is stout and rather short, its total length being less than twice the diameter of the shell; the posterior part of the body is the shorter one, and above rather sharply ridged; it ends with a large gland and a projecting horn above it. The whole body is uniform more or less dark brown, laterally strongly warty and obliquely grooved; the pedal row is very distinctly margined on both sides with an impressed line, and the margin of the foot below it is broad, smooth, marked with alternately brown and pale oblique stripes, so as to give the appearance of a variegated fringe. The eye peduncles and tentacles are of usual proportionate length, dark brown or even blackish, the latter with pale tips. On the whole, the general colour of the specimens varies a great deal; the young are mostly pale brown with an olivaceous tinge, while in old ones the neck, including the head and pedicles, become almost black.

The mantle is somewhat paler than the body, its edge moderately thickened. There are two small linguiform shell-lobes present, a right one, just below the inner or posterior angle of the aperture of the shell, thus playing on the inner lip, and producing its moderately distinct nacreous and callose structure. The other lobe lies below the outer periphery of the shell on the basal side; it projects from the outer end of a rather elongated very narrow fringe, which is separated from the edge of the mantle itself. The right necklobe is entire, thick, rounded, somewhat freely projecting at the lower or umbilical end. The left neck lobe is divided in two portions, the upper elongately rounded, the lower much narrower, with the upper end somewhat pointedly extended. The edge of the mantle which secretes the umbilical margin of the peristome is internally considerably thickened, (comp. pl. ii, fig. 13).

I have not been able to see satisfactorily the exact structure of the genital system, but, as far as it could be examined, it appears almost entirely to agree with that of *Rhysota semiglohosa*, figured by Semper. There certainly are no appendages present—neither on the penis, nor on the seminal duct or uterus.

^{*} E. v. Martens, Ost-Asiat. Expedit. p. 230, pl. 10, fig. 1.

The jaw is smooth, semilunar, with a round projection in the middle of the concave edge; it is about 2.5 m.m. broad.

The radula is comparatively of very great length. In a middle-sized specimen it measured 7 m.m. in length and 3 m.m. in breadth, although one of the ends was not quite perfect. I counted 106 transverse rows and about 141 teeth in each row. The centre tooth has a comparatively short point without any lateral denticles, and is somewhat smaller than the adjoining laterals. The first of these has a long, laterally bent, rather blunt projection; the following very gradually decrease in size and the middle cusp becomes gradually more pointed and curved, while the basal plate decreases. With about the fiftieth tooth the end begins to become bicuspid, and on about the hundreth tooth on either side, the two cusps are sharpest and best developed.

Semper (Reisen im Archipel der Philipp., Vol. III, p. 68) says that Rhysota does not possess any developed shell lobes of the mantle. In the present species their existence is undeniable, and still all the other characters of the animal and shell point towards the greatest relation of R. cymatium to other typical species of the genus, which scarcely would have any meaning, if it were restricted in the sense given to it by Semper. I very much doubt, that all the species with polished lower surface of the shell, referred by Semper to Rhysota, have no shell-lobes. How then do they produce the smoothness of the shell? I generally found shell-lobes essential for that purpose. But supposing some of the species really had no shell-lobes, this would be no sufficient reason for excluding any other species which possess them from Rhysota; for in Acsta we have a similar mixture of forms with and without shell-lobes.

Thus the only anatomical difference, which remains to be considered as distinguishing *Rhysota* from *Xesta*, is the simple form of the genital organs in the former. How far this character is really reliable for generic distinctions, is a point by no means easily settled, as I had already occasion to notice when speaking of the anatomy of the two species of *Situla (Conulema*, olim) (Journ. A. S. B., Vol. xl, Pt. ii, 1871, p. 236 &c.), *S. attegia* and *S. infula*.

When we compare the characters relating to the presence or absence or form of the mantle lobes, we meet with a perfect similarity between Rhysota and Rotula. The distinction between the two merely rests in the presence of an amatorial gland in the latter genus, while the shells only differ in the upper side of Rhysota being irregularly corrugated, and in Rotula reticulately striated, or transversely costulated.

In speaking of the shell of *Rhysota*, Albers gives the peculiarly rugose upper surface as one of the most important characters of the genus.

ROTULA* BIJUGA, n. sp., Pl. i, figs. 4-7 and pl. ii, figs. 16-18.

R. depresse conoidea et suborbiculata, vel late conica, angustissime umbilicata, tenui, cornea, pallide succinea; anfractibus 5:5 ad 6:5, suturâ simplici, suprâ rare filiforme marginata, junctis, lente accrescentibus, in superficie superiore convexiusculis, costulis transversis obliquis, confertis, striis spiralibus confertissimis ac plus minusve distinctis intersectis, crispatulis seu subgranulosis, ornatis; ultimo ad peripheriam acute carinato, ad basin modice inflato, nitido, sublevigato, striis incrementi radiantibus atque alteris spiralibus sub-obsoletis notato, medio cancaviusculo; apertura angulatim semilunari, paulum obliqua, labio tenuissimo vix distinguendo, labro ad marginem tenui, neque expanso, neque incrassato, ad insertionem umbilicalem brevissime reflexo instructa.

Dimensiones varietatum frequentium :-

Dian	ı. major.	D. minor.	Alt. testao.	Alt. aperturæ.	Lat. apertura.
a.	11.5	1 3·5	11 0	6.0	7.6 m.m.
ь.	16.2	15·0	10.9	6.6	8.2 ,
c.	17.4	15.6	12.0	7·2	9.2 "
d.	17.4	16.0	10.9	7.0	9.0 .,

Diam. maj. speciminis maximi 18.8 m.m.

It will be seen from the above measurements, which are taken from the four figured specimens, that the height of the shell is very variable, but the increase of the whorls is very nearly quite constant. The upper convexity of the whorls also slightly varies; the sides of the spire are generally nearly straight, more rarely conspicuously convex; occasionally the peripherical keel is somewhat projecting above the suture. The ornamentation is characteristically that of Rotula, reticulately sculptured above, nearly smooth below. The transverse ribs on the upper surface are traversed by fine spiral lines, which generally only produce a slight undulation in the direction of the ribs, sometimes, however, a fine granulation is formed. As regards form, the present species very closely resembles the Burmese R. anceps, (Gould), and also the South Indian R. Shiplayi, the first has, however, the upper costulation very fine and no spiral striæ, while the latter has both much stronger developed, producing a granular surface, and the shell is also more solid. The third very closely allied species is R. indica, differing principally by a greater width of the last whorl, and also by a stronger sculpture.

* Comp. Journ. A. S. B., 1871, Vol. xl, pt. ii, p. 231. The name Rotula has also been applied in the ACTINOZOA, but if our zoological classification should make such rapid progress, as it has done lately, it will, I think, in no long time be almost impossible to find new names for the generic groups, and we shall be forced to modify the existing rules at least so far that the same name may become reapplicable in at least the five or six principal divisions of the animal kingdom. A further relaxation of the rule would scarcely prove beneficial and would hardly be necessary.

The animal of the Penang species, when fully extended, equals in length about twice the longer diameter of the shell; back roundly flattened above, foot posteriorly obtusely ridged, terminating with a large gland which is superseded by a small horn; pedal row very distinct and the edge of foot below obliquely The general colour of the body is pale or livid grey, with a general reddish tinge when full grown. A pale vellow (in young), or more or less distinctly cinober red (in adults), stripe extends along the centre of the back and the superior ridge of the foot, the former is bounded on each side by a broad black stripe, originating at the base of each peduncle and continuing to the mantle, and below this stripe there is again a yellowish or red line. The posterior red band is only edged with black. The sides of the foot, both anteriorly and posteriorly, are more or less distinctly variegated with impure black and tinged with red; front of head between the two pedicles and tentacles with a black spot; pedicles and tentacles generally greyish, the latter with a reddish tinge, and with pale, rather large, globular tips, the former with a black ring at the base where the longitudinal black bands begin.

The mantle is moderately thickened. The right shell lobe is entirely obsolete, or only indicated by a very slight extension of the edge, a short distance below the upper angle of the aperture of the shell. Sole of foot divided by a longitudinal groove. The right neck lobe is large and extends as a moderately-broad fringe to near the retractor muscle where it terminates with a free end. The left neck lobe is smaller with a linguiform free outer end. The left outer edge of the mantle is externally also entire, like the right one, but about the middle of the basal portion it has internally a distinct lobe, about 2 m.m. in length, which in its situation strictly speaking lies between the shell and the neck lobe; but as it becomes reflected with its edge over the shell, it has to be regarded as the representant of the left shell lobe. The lower portion of the left neck lobe is only a thickened swelling, extending as a narrow inner rim of the edge of the mantle to near the umbilicus. Both the right and left neck lobe have a large black spot, in continuation of the lateral black bands of the back.

The general anatomy does not differ in any essential point from that of *R. anceps*, as briefly noticed by me in Journ. A. S. B., Vol. xl, pt. II, 1871, p. 233, pl. xvii, fig. 1.

The jaw is semilunar, perfectly smooth, with obtusely rounded corners, and a slight rounded projection in the centre of the coneave edge; it is about 1.5 m.m. based.

The length of the radula is about 4.5, and its breadth above 1.5 m.m.; it is composed of about 105 transverse, nearly straight rows of teeth, there being about 121 teeth in each row. The form of the teeth again very closely resembles that of *Rot. anceps*, (loc. cit.). All the points extend beyond the upper edge of the basal plate; the central is somewhat widened below

the terminal point, contracted in the middle, but it has no distinct denticles at the sides. The laterals gradually become more and more turned, and curved, with a small inner and scarcely a trace of an outer denticle; up to the 20th they very gradually diminish in size, then a very slight break follows, the 21st being somewhat sensibly smaller and first distinctly bicuspid at the tip, while at the same time the size of the basal plate has much diminished, until in the last teeth it almost entirely becomes obsolete; the two terminal cusps on the other hand become gradually more and more equal.

The genital organs have a distinct amatorial gland, possessing near its origin a large globose appendage, internally composed of an elliptical largely cellular mass, in which the cells are concentrically arranged with their longer diameter perpendicular to the walls of the ellipse. The posterior part of the gland is tilled with a finely granular substance,—probably calcareous particles. The vas deferens has only one slight enlargement about the middle of its length; it consisted in a simple thickening of the walls, but I could not trace any calcareous particles in it. Towards the end, where the penis is lodged, the tube is widest and somewhat curved, but there are no other appendages, or calcareous sacs accompanied with a flagellum, present, such as have been observed in many other species of *Rotula*.

SITALA* CARINIFERA, n. sp. Pl. i, fig. 8.

Testa globose conoidea, cornea, apice obtusula, angustissime perforata; anfractibus quinque, gradatim accrescentibus, convexe angulatis, sutura simplici junctis, transversim minutissime striolatis, superis infra medium carinis filiformibus duobus ornatis, ultimo ad peripheriam tricarinato, basi planate convexiusculo, lævigato; apertura semilunari, verticali, non descendente, labro extus tenuissimo, in regione columellari paululum reflexiusculo.

Diam. maj. 2.2, minor 2., alt. testre 2. m. m.

Hab .- 'Penang hill,' in foliis Coffee arabice, specimen unicum.

The animal of this species is exactly like that of S. infula, figured in pl. xviii, in J. A. S. B., Vol. xl, Pl. ii, for 1871; it has a generally pale brownish grey colour; but having obtained a single specimen, I did not like to sacrifice the shell, in order to notice the internal structure; for when examining these little species one is by no means sure, that he will obtain from a single specimen an insight into the whole anatomy.

The present species is closely allied to the Nilgheri *Helix tricarinata*. Blf., which is also a *Sitala*, and differs by a more depressed and broadly conical shape, and by having a much wider umbilicus.

^{*} H. Adams proposed this name for Helix infula, Bens., as type (P. Z. S. for 1865, p 408). I had unfortunately overlooked this reference, when I proposed for Benson's attegia (and infula and a few others) the name Conulema, which must now be regarded as identical with situla (J. A. S. B., xl, pt. II, p. 236.)

MACROCHLAMYS* STEPHOIDES, n. sp. Pl. i, fig. 9, and pl. ii, figs. 19-20.

M. orbiculata, spira depresse convexiuscula, basi medio concaviuscula, angustissime perforata, tenui, succineo cornea, unicolore, circa umbilicum albescente; anfractibus sex, lentissime accrescentibus, sutura lineari junctis, infra suturam angustissime adpressis, nitidis, fere politis, striis incrementi transversis minutissimis, nonnunquam fere omnino obsoletis, notatis, supra convexiusculis; ultimo ad peripheriam fere uniforme convexo; apertura subsemilunari, vix obliqua, labio per-tenui, labro simplici, ad basin paulum sinuose producto, ad insertionem umbilicalem anguste atque breviter reflexo. Diam. maj. 11.6, d. min. 10.7, alt. 7; alt. apert. cum perist. 4.8, ejusdem lat. 5.6 m.m.

The nearest ally of this species, as regards general character and size, is the Andamanese *Macroch. stephus*,† (Benson), differing from the present species by a somewhat more depressed form and by having the sides of the spire nearly straight or slightly concave, but not convex. *Macroch. hyalina*,‡ Martens, is also very closely allied, it is a larger shell and with a more rapid increase of the volutions, the difference between the smaller and larger diameters being 2.5 m.m. In Burma and Sikkim several other allied forms occur, such as *M. hypoleuca*, *patane*, *petasus*, &c., but they are all smaller and more depressed shells.

The species is rare; I found a single live specimen and half a dozen of old shells at the base of Penang hill, about 300 feet.

The animal is long and very slender, blackish grey above and on the pedicles, paler at the sides of the foot, which has a long and thin horn above the tail gland. Both shell and neck lobes are well developed, the right ones larger than the respective left ones. The two shell lobes are linguiform, and the right one, when fully expanded, covers almost half of the upper surface of the shell. The lower portion of the left neck-lobe is merely represented by a slightly thickened rim, extending from the place of insertion of the left shell-lobe to near the umbilicus.

The jaw is one mill, broad, with a central rounded tooth in the concave edge and with the corners somewhat bent outwardly; a form which is also met with in several other species of *Macrochlamys*.

The radula has not been seen perfect, but it does not appear to have been more than four mill. long, and there appear to have been at least 101 teeth in each transverse row; all with very sharp points; the central with

- * Comp. Journ. A. S. B., vol. xl, pt. ii, 1871, p. 246.
- † The figure of this species in Conch. Ind., pl. 62, is taken from a young or imperfect specimen, in which the poculiarly depressed form is not so well discernable as in an adult shell. Fig. 6 on the same plate is incorrect, because it does not show the sinusely produced median basal portion of the peristome.
 - † Preuss. Exped. nach Ost Asien, II, p. 241, pl. 12, fig. 5.

a distinct denticle on either side, and the last laterals with two small unequal cusps; all have the basal plate obtusely narrowed outwardly.

The genital organs are very similar to those of *M. indicus*, Benson, but much more slender; the amatorial gland is very thin (in a young specimen), there is a small cocal appendage on the vas deferens, and a flagellum at the base of the penis, just before a swelling filled with calcarcous particles.

MICROCYSTIS* PALMICOLA, n. sp. Pl. i. fig. 10.

M. testa late conica, tenui, cornea, angustissime umbilicata; anfractibus quinque, gradatim accrescentibus, convexiusculis, sutura simplici junctis, supra splendore albide sericino, transversim oblique, minutissime atque confertissime, striolatis, ultimo ad peripheriam acute angulato; basi convexiuscula, olivaceo nitita; apertura subsemilunari, extus angulata, obliqua; labro tenui, simplici, ad basin recedente, ad umbilicum reflexo; labio tenuissimo, vix distinguendo. Speciminis maximi diam. maj. 2·8, d. minor 2·6, alt. 2·2, diam. apert. 1·7, ejusd. alt. 0·95 m.m.

Hab.—Penang, sub corticem Coccos nuciferæ, haud frequens.

The shell is distinguished from allied species by its comparatively sharply angular last whorl, slightly inflated base and by the peculiar silky and very finely striated upper surface.

The animal when fully extended equals in length about four diameters of the shell; it is rather dark brownish grey, darkest on the tentacles and on the rostrum; posterior gland superseded by a small horn.

Helicarion† permolle, n. sp. Pl. i, fig. 11 and pl. ii, figs. 21-23.

H. testa depresse inflateque conoidea, tenuissima, fere membranacea, translucente, pallide lutescente, vix perforata, spira ultimo anfractu multo breviore; anfractibus 4.5, rapide accrescentibus, ad suturam simplicem adpressis, nitidis, convexiusculis, ultimo inflato, ad peripheriam rotundato, transversim lente arcuateque striatulo, ad basin striis spiralibus sub-obsoletis notato; apertura lunari, valde obliqua, labio albescente, minutissime puncticulato, labro tenuissimo, simplici, ad basin valde recedente, ad marginem interiorem umbilici breviter reflexiusculo. Diam. maj. 8.4, d. min. 7.4, alt. 6.3; alt. apert. cum perist. 4, ejusd. lat. 4.3 m.m.

The rather strongly elevated spire, and the membranaceous and transparent structure of the shell, separate this species from the numerous allied forms of the Philippines. The species is rare; I only obtained about half a dozen specimens on low bushes or between old vegetable matter on the ground, about 500 feet above the sea, on Penang hill.

^{*} Microcystis, Beck. Comp. Semper in Reis. Arch. Philipp., pt. II, vol. iii, 1870, p. 43, and Stoliczka in J. A. S. B., vol. zl, pt. II, p. 251.

[†] Semper, Reisen Archip. der Philippinen, vol. iii, p. 20.

The animal is slender and very long; when fresh the extended foot is three times the longer diameter of the shell, which is then entirely covered by the mantle; but in captivity the shell lobes shrink very rapidly, being reduced to narrow linguiform appendages. Middle of back and of the hind foot whitish or very pale brownish, with a slight pinkish tinge; a broad blackish band runs from each pedicle along the sides of the whole back, and also on the sides of the posterior part of the foot, as far as the terminal gland, which is superseded by a very distinct pointed horn; the dark colour extends down to the pedal row, while a large black spot about the middle of the foot on each side reaches down to the sole; pedicles long, grey; tentacles short and almost white; mantle blackish with small whitish dots. All the four mantle lobes are well developed, the left shell and neck lobes are proportionately somewhat larger than the corresponding right ones, and each of the former has a deep but narrow incision in its lower portion.

The jaw is about one mill. broad, quadrant shaped, smooth, without any projection in the centre of the concave edge, like in most other species of the genus.

The radula is moderately broad and nearly 2.5 m.m. long; there are 95 transverse rows and about 121 teeth in each row, all remarkably small and from the tenth tooth they somewhat rapidly decrease in size towards the edges. The centre tooth has two distinct denticles on either side and a third much smaller one nearer to the base; the principal cusp is pointed. On the subsequent teeth the inner denticles disappear first, and gradually altogether, then the lower outer, while the upper outer remains, until at last it equals the principal cusp, so that the outermost teeth become almost regularly, though shortly, bicuspid.

The general anatomy does not offer any peculiarity requiring special notice. The nervous and digestive apparatus agrees with that of other ZONITTIDE, except perhaps that the liver is enormously largely developed. The female portion of the genital system has a long sub-pedunculate receptaculum seminis, branching off at its origin. The vas deferens is very short, passing into a rather widened tube, again somewhat contracted near the base of the penis, which is attached by a special strong muscle. The end of the penis widens very rapidly for a short distance before it joins the hermaphrodite opening. I have not observed, in two specimens examined, any coccal or calciferous appendages.

Genus. TROCHOMORPHA, Albers.

Heliceen, Edit. E. v. Martens, p. 60, and Preussiche Exped nach Ost Asien vol. ii, Landschnecken, 1867, p. 245; Nigritella and Videna, ibidem. Sivella, Blanf.

The type of this genus is *Helix trochiformis*, Fèr., which is characterised by a moderately solid, sub-discoid or depressedly conical shell, the whorls being flattened above, the last carinate at the periphery, the aperture rhombiform or narrowly semilunar with simple sharp edges, but the columellar lips occasionally internally somewhat thickened and slightly reflexed.

I do not know whether the animal of this typical species had been examined, but I have observed those of about a dozen different species, which evidently belong to the same type, and I find that all of them possess a very fine glandular slit at the upper end of the foot, the pedal row being in all also distinct; they have, therefore, to be referred to the ZONITIDE, as already noticed in my paper on the Moulmain shells in Jour. A. S. B., vol. xl, pt. II, 1871, p. 225.

Judging from a somewhat more intimate examination of the animals of a few species, the following characters have to be added to those derived from the peculiar shape of the shell.

Animal moderately slender, with the posterior part of the foot shorter than the anterior, the former terminating above with a small glandular slit; pedal row distinct; mantle with clongated narrow neck lobes, but with the shell lobes entirely wanting, left neck lobe sometimes divided or insinuated in the middle; jaw smooth; genital organs without amatorial gland, or any other appendages; seminal receptacle and seminal duct very long.

The Trochomorphæ live on the ground generally in decaying vegetable matter, under or on old wood. Three species have been found on Penang.

Albers, while noticing several typical species, such as *T. planorbis*, Less., under his genus *Discus*, referred to *Trochomorpha* a most varied mixture of shells: for instance; anceps, Gould, serrula, Bens. etc. which belong to *Rotula*; Barrackpoorensis, Pfr., is a Kaliella; cacuminifera and infula, Bens. are Sitalæ (= Conulema, olim); H. capitium, Bens., does not belong to the present family, but to the next, the true Helicidæ, etc.

E. v. Martens (l. cit. pp. 246 and 247) adopted two groups in the genus Trochomorpha; the one, for which he proposes the name Nigritella, includes the obtusely conoid and more solid shells, sometimes with a somewhat obtuse periphery; these are true Trochomorpha, of the type of H. trochiformis, or of Troch. Ternatana, Guillou; the name Nigritella is, therefore, entirely superfluous. The second group is classed by Martens as Videna, Adams; it includes the more planorboid and sharply keeled species of the type of H. planorbis, Less. For this same group, (type H. castra, Benson,) W. T. Blanford proposed the subgeneric name Sivella.

Judging from the similarity of the shells of these two groups and from what we know of the animal of *T. Ternatana*, observed by Martens, I very much doubt that any necessity exists for subdividing the genus *Trochomorpha*.

TROCHOMORPHA CASTRA, (Benson). Pl. i, figs. 14-16 and pl. ii, figs. 7-9.

Heliv castra, Benson, Ann. and Mag. Nat. Hist., 1852, vol. x, p. 349.—Reeve,
Conch. Icon., Helix, No. 1160.

The shell is subject to a very considerable amount of variation as regards the elevation of the spire. Young specimens are sometimes almost planor-bular, and in some adults the total height of the shell is scarcely more than one-third of the larger diameter, while in others it somewhat exceeds one half of the same dimension. The width of the umbilicus varies from 0.2 to 0.3 of the diameter of the shell. The base is always distinctly spirally striated, but on the upper side the oblique transverse striae of growth prevail. The usual colour is pale horny, sometimes brown with a pale band below the suture.

The species is very rare on Penang hill, but it is common in Pegu, Arakan, Assam, Sikkim, and within the last few years it became abundant in the botanic garden near Calcutta, having been most likely introduced from Darjeeling. One of the largest Sikkim specimens in my collection measures: larger diam. 13, smaller diam. 12, height of shell 7, same of apert. 3, width of same 5.4 m.m.

The animal changes from dark leaden to blackish grey, being always paler at the sides of the foot, generally tinged with brownish below the pedal row; tentacles and pedicles mostly somewhat darker than the body; neck distinctly warty; sole dark grey, entire, without any distinct furrows; tail gland represented by a fine slit about one mill. long. The total length of the foot generally equals one and a half diameters of the shell, the caudal portion being always shorter than the anterior one. The mantle is blackish and in its extent above the large pulmonary cavity variegated with pale spots.

The jaw is smooth, very thin, almost semicircular with broad oblique ends and a small, in younger specimens sometimes almost obsolete, projection in the centre of the concave edge; its width is about one half millimetre.

The radula is narrow, about two mill. long, or slightly longer, composed of about 85 transverse straight rows, there being about 101 teeth in each of them. All have very sharp, long and pointed cusps, the central with a small denticle on either side near the tip; on the outer ones, as they turn laterally and gradually decrease in size, the inner denticle disappears, while the outer increases, until on the last 15 or 20 teeth, preceding the 3 or 4 terminal ones, it equals the principal cusp. The last few teeth are short, broad, and their outer cusp becomes almost entirely obsolete, the teeth presenting merely an oblique sharp edge.

The female portion of the genital organs has a globular swelling near its origin at the hermaphrodite opening, and the receptaculum seminis branches off above this gland, it is fully one inch long, somewhat thickened in the middle. The penis is attached by a short muscle, about 4 m.m. long and moderately thickened.

TROCHOMORPHA CANTORIANA, (Benson). Pl. i, fig. 13.

Helix Cantoriana, Benson, Ann. and Mag. Nat. Hist., 1861, vii, p. 85.

Five specimens which I found on Penang hill (at about 2000 feet elevation) exactly correspond with Benson's description, which was taken from a solitary specimen obtained by Dr. Cantor on the small island Sung-Sung near Penang. The illustration given on plate i will dispense with a repetition of the description quoted above. The apex is smooth, slightly swollen, and there are scarcely more than five whorls in specimens of 10 m.m.

The animal is blackish grey with a very narrow, pale dorsal stripe, quite similar to that of *T. castra*, but by some accident no specimen was preserved in spirit, so I cannot give any further details of its structure; it is, however, certainly a *Trochomorpha*. The specimens were found under a log of old wood.

TROCHOMORPHA TIMORENSIS, Martens. Pl. i, fig. 17, and pl. ii, figs. 10-12. E. v. Martens, in Preuss. Ost-Asiat. Exped., 1867, II, p. 248.

Penang specimens, of which I obtained sixteen, entirely agree in form and structure with the shell described by E. von Martens, with the single exception that the last whorl is not descending near the aperture, but there is an inclination to it, as its terminal portion in adult specimens is slightly more bent dewnwards than the preceding part (comp. figs. 17a and 17b). This character is, however, certainly a variable one; it does also occasionally occur in adult specimens of T. castra and T. planorbis. The differences noticed by E. v. Martens regarding the greater number of whorls, and the larger umbilicus, with less rapidly descending sides, in Timorensis, when compared with planorbis, are well marked in Penang examples.

The species is found sparingly on or under old wood all over Penang hill; *T. planorbis* was not met with there, but it is a very abundant shell at the Nicobars.

The animal is uniform blackish, mantle more intense black; pedal row distinct and the edge of the foot below it nearly quite smooth; neck and sides covered with small warts; tail gland represented by a very fine slit, scarcely more than half a millimetre long.

The jaw and radula are quite similar to those of *T. castra*. The former is about three quarters mill. broad, with somewhat curved out ends and a broadly rounded central projection in the concave edge. The teeth are very slender, and the lateral denticles are very close to the tip on the centre tooth. The outer denticle descends a little lower down on the laterals, but it

always appears to remain smaller than on the corresponding teeth of *T. castra*; the outermost laterals were not observed, they must be very thin.

The genital organs are distinguished by a very great length of the seminal receptacle and of the seminal duct; the former is one and a half to nearly two inches long; it is somewhat widened near its origin but further on almost throughout equally thin.

Fam. Vitrinidæ.

VITRINA NUCLEATA, n. sp. Pl. i, fig. 12 and pl. ii, figs. 4-6.

Vit. testa depresse ovata, tumidula, tenui, pallide cornea, translucente; anfractibus 3.75, nucleo 1.5 anf. composito, late conico, inflato, lævigato, duobus anf. sequentibus ad suturam adpressis, subcanaliculatis, rapide accrescentibus, nitidis, transversim striis incrementi minutissimis notatis; apertura ampla, per-obliqua, labio undique tenuissimo, ad basin valdo recedente, margine supero convexiusculo. Diam. maj. 9, diam. minor 7, alt. test. 5.3, alt. aperturæ 4.8, ejusdem latitudo 6.1 m.m.

A characteristically distinct species, by having the nucleus composed of one and a half whorls, conically tumid, while the next whorl is at its beginning only very narrowly exposed, or almost entirely covered. The outer lip is very thin, almost membranaceous, and simple throughout.

V. nucleata is one of the rarest Penang shells. I found three live specimens on the Penang hill in dense forest on old wood, about 1000 feet above the sea, and two more old shells at the base of the hill.

The animal is entirely black, only slightly paler at the front sides of the foot; it is very long and slender, its total length being about four times that of the longer diameter of the shell; the anterior part is the much shorter one, the posterior tapers into a point, and the whole is warty and grooved. The mantle, however, is nearly smooth. In quite fresh specimens the two shell lobes entirely cover the shell, but generally the left lobe covers a little more than one fourth of the last whorl extending from the margin of the mouth, while the right lobe also covers one-fourth of it beginning at the angle of the mouth, but at the same time also envelopes the whole spire. The neck lobes are also well developed, rounded, with simple edges, the left is much larger and longer than the right one. The sole of foot is pale brown, divided by two grooves in nearly three equal parts, of which the median is smooth and the lateral transversely sulcated. Pedal row well marked by a thin groove above and along the entire base of foot.

The jaw is semilunar, radiately finely striated, with a blunt projection in the centre of the concave edge; the outer or convex portion is smooth; it measures about 0.75 m.m. in breadth.

The radula is about two mill. long and half a mill broad; there are 110 transverse, almost quite straight rows, but only 61 teeth in each of them.

All have very sharply pointed cusps, the central has two small lateral denticles on either side; on the outer ones these denticles almost entirely disappear.

The genital organs are distinguished by a great length of the uterus, at the end of which lies a large albuminous (ag.) and hermaphrodite gland (hg.). The seminal receptacle (rs.) is a long, pedunculated, spacious bag which includes a peculiarly twisted, horny organ, provided on the concave side with short crispate appendage. It is the same problematic organ which I described in Sesara infrendens, Gld., and Macrochlamys [Durgella] honesta, Gld., (Comp. J. A. S. B. XL., Pt. 11, p. 242 and 250, pl. xvi, fig. 5 and 6, and pl. xvii, fig. 13). Whether this structure represents the amatorial organ and whether that which we call a seminal receptacle really possesses the function which we attribute to it, appears to be as yet an open question. In the present species I found the terminal end of the so-called seminal receptacle filled with a milky substance, which under a high power exhibited a quite irregular flaky appearance.

In other respects the present species does not offer any anatomical peculiarities. The esophagus is comparatively thin, long, cylindrical. The kidney, situated near the end of the rectum, is very large, of a broadly triangular shape; the liver enormously developed.

Some years passed the Vitrinæ had been classed as a subfamily of the Helicidæ; more recently they had been by various authors treated with the Zonitidæ, in the Oxygnathe group of Helicacea. I think the older classification is preferable, as entered by Binney and Bland in their Land and Freshwater shells of N. America. But I would prefer to give them, together with Helicolimax, Hyalina and their allies, a position intermediate between the two families. They combine indeed several of the characters of both. Although they do not possess a terminal mucous gland on the end of the foot (as all Zonitidæ do), they have a more or less distinct pedal row, and the sole appears to be often divided by longitudinal grooves. The jaw is entirely or partially finely transversely striated, not quite smooth, as usually in Zonitidæ, and not ribbed, as in true Helicidæ. However, the teeth, particularly the outermost laterals, have more the pointed character of the former than of the next family.

Fum. Helicidse.

Trachia* Penangensis, n. sp. Pl. iii, figs. 1 and 18-20.

T. suborbiculata, alta, spira breviter elevata, obtusa, modice sed profunde umbilicața, tenui, fere cornea, cuticula luteo-fusca dense et breviter pilosa induta, unicolore; anfractibus 4.5, convexis, sutura profunde subcanaliculata junctis, ultimo ad peripheriam uniforme convexo, ad aperturam paulo descen-

[•] Compare, Stoliczka in Journ. A. S. B, vol. zl, Pt. II, 1871, p. 228.

dente, ad marginem umbilici obtuse angulato; apertura semilunari, labio tenui, labro expanso atque reflexo, ad insertionem umbilicalem paululum dilatato, ad basin indistincte subangulato, pallide violaceo tincto. Diam. maj. 16, diam. min. 14.5, lat. aperturæ cum perist. 8.8, ejusd. alt. 8.2 m. m.

As regards the thin, almost horny, fulvous, thickly and finely setose structure of the shell, this species is probably most closely allied to *T. erinacea*, Pfr., but it differs from it, as well as from two other very similar forms, *T. quieta*, Reeve, and *T. eustoma*, Pfr., by its conspicuously more elevated spire. Other species of similar type, like *T breviseta*, Pfr., from Siam, *T. Helferi*, Bens., from the Andamans, and four or five others described by Pfeiffer and E. v. Martens have nearly all a more depressed form and mostly sub-angular last whorl, although their spire is somewhat elevated.

The animal is dark chocolate brown, with a very narrow pale dorsal and caudal stripe, the body is laterally somewhat more blackish in front, and tinged brownish behind; the posterior end of the foot is the shorter one, as in *Trochomorpha*, although not to the same extent.

The jaw is quadrant shaped, with about six strong ribs,* and one or two less distinct ones on either side; it is 1.3 m.m. broad.

The radula is about 2.5 m.m. long., and 1. m.m. broad; there are 95 transverse rows, and 91 teeth in each of them, decreasing in size the more they approach the edges. The centre tooth is slightly smaller than the first laterals. All have a large basal plate, which is on the centre tooth slightly emarginate in the middle of the upper edge; this emargination increases in depth on the laterals, the inner branch remaining smaller, until on the last ones the upper edge becomes represented by two obtuse branches. The hook is on all teeth comparatively small, broad, with a moderately sharp point. On about the tenth tooth a small denticle appears to shew on the outer edge near the tip, becoming more distinct on the following teeth. After the eighteenth lateral, the teeth become somewhat more rapidly shorter, but increase in width until the last are wider than long, or high, and on these the basal plate has almost entirely become obsolete.

The genital organs are more than an inch long. The female portion has a long seminal receptacle, strongly thickened and muscular for some distance from its origin, then passing into a long thin tube and terminating with a moderately enlarged bubble, attached by very thin muscular fibres to the albuminous gland which is situated at the end of the uterus. The vas deferens takes its origin near the upper end of the uterus; it is attached by numerous thin threads at the hermaphrodite opening, and after a short distance enlarges into a muscular tube. At the beginning of this enlargement is a short pointed flagellum (f), and at the

[·] Evidently very much like that of Campylea.

other end, where the penis begins, is a retractor muscle. The penis itself has near its base a coccal appendage; its terminal portion, before it joins the hermaphrodite opening, is very thin.

A comparison of the genital organs with those of *Trachia delibrata*, represented in J. A. S. B., vol. XL, Pt. II, 1871, pl. xvi, fig. 1, will shew, that the only essential difference consists in the presence of the small coccal appendage on the penis in *T. Penangensis*. The jaw has fewer and less strong ribs, than that of the former species, but the teeth themselves are extremely similar.

Taking all these anatomical characters together with those of the shell, as noticed in my paper cited above, I think we can consider *Trachia* as a fairly established genus of the Helicide.

HELIX [FRUTICICOLA] SIMILARIS, Fér. Pl. ii, figs. 1-3.

Comp. E. v. Martens in Preuss. Exped. nach Ost-Asien, vol. II, pp. 43 and 270, etc. Stoliczka in J. A. S. B. vol. XL, Pt. II, 1871, p. 224.

On Penang this species is mostly found in the coco-palm plantations up to a height of about 200 feet, never in the interior of large forests and at great_elevations. The shells are of the usual small size (larger diam. between 12 and 13 m.m.), with or without a brown peripherical band. The strize of growth are generally fine, but in some specimens they accumulate to strong ribs which give the shell a very peculiar costate appearance.

I also obtained the species from Malacca, near Singapore, Hongkong, Chusan, Maccao, Canton, &c., northwards it extends through Tenaserim into Burma, where it is associated with a great number of closely allied species, some of which may prove to be mere varieties of it. I may mention H. bolus, H. scalpturrita, H. Zoroaster, &c.

In Bengal itself the species is not known, but in Central India it is represented by *H. propinqua*, and on the Andamans by *H. hemiopta*. Judging from the great number of closely allied species in the Inde-Malayan region, there is certainly the greatest probability that the original habitat of *H. similaris* falls within the Indo-Malayan Archipelago, and that it has been introduced into Mauritius, China and South America.

The animal is rather slender, all over strongly warty, brownish fleshy white, or pale brown, the pedal row is very slightly indicated by a fine groove; the pedicles and tentacles are greyish white, mantle dull milky white with a slight vermilion tinge. When the animal is quite fresh the total length of the foot is equal to from two and a half to three longer diameters of the shell.

The jaw is semilunar, about 1 m.m. broad, with three strong central ribs, followed by a somewhat broader one on either side, while the next is only indicated by a faint dark line.

The radula is when compared with the size of the animal large, about 2.3 m.m. long, and somewhat more than one m.m. broad; it is composed of about 90 transverse rows, with 67 teeth in each of them. The central is much smaller than the adjoining laterals, with a long arched cusp. The laterals somewhat rapidly decrease in size after the 14th; on the outermost the basal plate gradually disappears, while the breadth of the teeth exceeds their length.

The genital organs are more complicated than in *Trachia*. The female portion has at its origin a rather short, thick mascular coccal appendage, which most probably represents the amatorial gland; it is widened near its origin and at its rounded end. The seminal receptacle is a round bag, attached to a long thin peduncle of about the same length as the uterus. The seminal duct is moderately long, but the penis comparatively thick and attached by a strong muscle.

Fam. Bulimidæ.

BULIMUS .- Subg. Amphidromus.

The only two species which I found among the coco-palms were Bulimus atricallosus, Gould, and B. interruptus, var. citrinus; the uniform coloured greenish yellow variety. The former is the more common species.

Besides these two, the ubiquitous Stenogyra gracilis is by no means rare at the roots of palm trees.

Fam. Clausiliide.

CLAUSTLIA (PHÆDUSA) PENANGENSIS, n. sp. Pl. ii, figs. 4-6 and 15-17. C. testa fusiformi, plus minusve atenuata, medio ad anfractum penultimum latissima, non rimata, solidula, castanea, apice submammillata, albescente, anfractibus 9·5 ad 10·5, convexis, sutura simplici junctis, transversim confertissime striolatis, penultimo sensim attenuato; apertura ovata, intus castanea, peristomate modice expanso, undique libero, albescente, plica supera crassa, ad marginem aperturæ continua, columellari immersa, tenui, valde oblique intrante; plicis palatalibus six, prima longissimima, unam mill. a margine suturali distante, ceteris multo brevioribus, subæqualibus, modice curvatis atque fere æquidistantibus.

Var. brevis, exquisite fusiformis, vide fig. 6 et 6a; long. 24, lat. 6.2, apert. cum perist. 6 longa, 4.5 m.m. lata.

Var. elongate fusiformis, vide fig. 5; long. 26.3, lat. 6.2, apert. 6.9 longa, 4.7 m.m. lata; in hoc specimine apertura exceptionaliter longa.est, in speciminibus alteris, forma similibus, longitudo apertura 6.2 ad 6.4 observands.

• The total number of Ordinary members at the close of 1872 is thus shewn to be 443, or three members less than at the end of the previous year. But in the member list for 1872, published with the Proceedings for February lat, the names of five gentlemen were retained although they had not till then paid in their admission fees; and according to rule 5 of the Bye-laws their election has become null and void.

FEB.

The actual total for the year is thus reduced to 138. Of which number 277 are paying members, (105 resident in Calcutta, 172 in the mofussil,) 159 are absent from India and 2 are life members, thus showing a sensible decrease in the number of paying members.

The following table exhibits the number of paying and absent members for the last 10 years.

	Year.	•	P	aying	Absent.	Total.
		\mathbf{R}	osident.	Non-Resident.		
	1863	276	(130,	146)	79	355
	1864	22 8	(133,	195)	92	320
	1865	267	(136,	131)	109	376
	1866	293	(124,	169)	94	387
	1867	2 07	(154,	153)	109	416
	1868	294	(159,	135)	133	427.
	1869	304	(162,	142)	138	412
	1870	266	(134,	132)	148	414
	1871	286	(112,	174)	160	416
,	1872	277	(172,	105) 2L l	M. 159	438

Two Honorary members were elected during the year, viz. Professors G. B. Airy and T. Huxley.

The Council regret to announce the deaths of C. Horne, Esq., C. S. Rev. J. Roberts, W. Abbey, Esq., Dr. T. C. Jerdon, Hon'ble Sir D. F. Macleod, C. B., K. C. S. I. Captain A. B. Melville, J. W. Laidlay Esq., and Sir W. Denison, K. C. B., Ordinary members; also of Dr. T. Goldstucker who was a corresponding member of the Society, and Col W. H. Sykes F. R. S., an Honorary member.

The Society had the misfortune to lose their late Patron, the Right Hon'ble, the Earl of Mayo, who was assassinated in March. On the arrival of H. E. the present Viceroy, Lord Northbrook, the vacant office was tendered to him and graciously accepted.

Museum.

The Council continue to carry out the provisions of Act XVII of 1866 and transfer all Natural History and Archæological donations received by them, to the Trustees, Indian Museum. A list of these donations is given in the Application to the Proceedings.

Baja And Russin Khan Bahadur, C. F. Bligh, Esq., C. F. Daukes, Esq., G. C.

The Trustees on the part of the Society were Mr. W. S. Atkinson; Mr. H. F. Blanford, Dr. F. Stoliczka and Col. J. E. Gastrell, who is to hold the office during the period the Superintendent of the Geological Survey continues President of the Society.

Finance.

The actual total receipt by subscriptions from members during the year under review amounts to Rs. 7,551, against Rs. 8,516 of the previous year. The amount due from members on account of subscriptions is Rs. 5,685 against Rs. 5,200 of the previous year and the Council would again earnestly urge on members the importance of punctual payments of their subscription, and the early paying up of all arrears.

The following table exhibits an abstract of the accounts for 1872.

ACTUAL	INCOME	DURING	1872.
--------	--------	--------	-------

Admission fees, 768 0 0 Publications, 1,276 8 9 Library, 277 2 0 Secretary's office, 19 11 0 Vested Fund, 108 14 0 Sundries, 748 14 3 Rs. 10,750 2 0 Balance in the Bank of Bengal, 2,236 5 7 Cash in hand, 216 14 3 Rs. 13,203 5 10 EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Secretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 3 Balance in the Bank of Bengal, 767 9 4 Cash in hand, 143 15 2	Subscriptions,Rs.	7,551	0	0
Publications, 1,276 8 9 Library, 277 2 0 Secretary's office, 19 11 0 Vested Fund, 108 14 0 Sundries, 748 14 3 Rs. 10,750 2 0 Balance in the Bank of Bengal, 2,236 5 7 Cash in hand, 216 14 3 Rs. 13,203 5 10 EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Secretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 784 10 8 Balance in the Bank of Bengal, 767 9 4	Admission fees,	768	0	0
Library, 277 2 0 Secretary's office, 19 11 0 Vested Fund, 108 14 0 Sundries, 748 14 3 Rs. 10,750 2 0 Balance in the Bank of Bengal, 2,236 5 7 Cash in hand, 216 14 3 Rs. 13,203 5 10 EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Secretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 3 Balance in the Bank of Bengal, 767 9 4		1,276	8	9
Secretary's office, 19 11 0	Library,	277	2	0
Vested Fund, 108 14 0			.11	0
Rs. 10,750 2 0			14	0
Balance in the Bank of Bengal, 2,236 5 7 Cash in hand, 216 14 3 Rs. 13,203 5 10 EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Secretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 8 Balance in the Bank of Bengal, 767 9 4			14	-
Balance in the Bank of Bengal, 2,236 5 7 Cash in hand, 216 14 3 Rs. 13,203 5 10 EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Secretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 8 Balance in the Bank of Bengal, 767 9 4	Rs.	•		•
Rs. 13,203 5 10 EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Sceretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 8 Coin Fund, 135 11 0 Sundries, 734 10 8 Balance in the Bank of Bengal, 767 9 4	Balance in the Bank of Bengal,		₩,	
EXPENDITURE DURING 1872. Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Sceretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 784 10 8 Balance in the Bank of Bengal, 767 9 4	Cash in hand,	216	14	3
Publications, Rs. 6,703 8 2 Library, 1,344 4 3 Secretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 8 Balance in the Bank of Bengal, 767 9 4		13,203	5	10
Library, 1,344 4 3 Sceretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 3 Balance in the Bank of Bengal, 767 9 4	EXPENDITURE DURING 1872.			
Sceretary's office, 2,520 0 1 Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 734 10 3 Balance in the Bank of Bengal, 767 9 4	Publications,Rs.	6,703	8	2
Vested Fund, 0 4 4 Building, 853 7 3 Coin Fund, 135 11 0 Sundries, 784 10 8 Balance in the Bank of Bengal, 767 9 4	Library,	1,344	4	3
Building, 853 7 8 Coin Fund, 135 11 0 Sundries, 734 10 8 Balance in the Bank of Bengal, 767 9 4	Secretary's office,	2,520	0	1
Coin Fund, 135 11 0 Sundries, 784 10 8 Balance in the Bank of Bengal, 767 9 4	Vested Fund,	• 0	4	4
Sundries, 734 10 8 Balance in the Bank of Bengal, 767 9 4	Building,	853	\ 7	3
Balance in the Bank of Bengal, 767 9 4	Coin Fund,	135	11	0
	Sundries,	784	10	8
	Balance in the Bank of Bengal,	767	9	4
		148	15	2

Rs. 13,208 5 10

The expenditure for 1872 has slightly exceeded the estimate, but has been considerably in excess of the income as will be seen from the following table.

•	INCOME.					Expenditure.						
· -	Estimate.		Actual, 1872.		Estimate.			Actual.				
Subscriptions,	1.500 250 0 0 0	000000000000000000000000000000000000000	0 0 0 0 0	768 1,276 257 0 19	0 11 0	0000000	5,000 2,150 100 3,0 :0 1,000	0 0 0 0 0 0	000000000000000000000000000000000000000	0 #6,703 †1,344 135 2,520 853	0 0 8 4 11 0 7	0 0 2 8 0 1 3
Sundries,	800 12,050	0	0	793 10,685		3 0	80J 12,050	0	0	12,266	7	0

The following is the estimated income and expenditure for 1873.

ESTIMATED INCOME FOR 1873.

Subscriptions,	7,500	0	0
Admission Fees,			
Publications,	1,200	0	0
Library,	250	0	0
Sundries,		0	0
Coin Fund, Secretary's office, Building,	. 0	0	0
Rs.	10,450	0	0

ESTIMATED EXPENDITURE.

Subscriptions,Rs.	0	0	0
Publications,			
Secretary's office,	2,600	0	0
Sundries,			
Building,	1,000	0	0
Coin Fund,			
Libray,	3,000	0	0
e, (Rs.	10,450	0	0

^{*} For further particulars see Appendix (1).

to This does not represent the actual cost of the Library for the year. It is for keeping the Library establishment and for binding books, but the greater portion of the periodicals are lying unknund for want of sufficient funds. The cost of books purchased from Mours. Williams and Norgate and Trübner is represented under liabilities.

Library.

The Library received, in 1872 an addition of 859 volumes or parts of volumes. The greater portion of this addition is made up by donations from the Government and by exchanges with other Societies.

In order to increase the usefulness of the library lists, the Council have directed that an abstract of the titles of articles in the various journals and other works received by the Society, likely to be of interest to the members of the Society, may be printed in the Proceedings.

The collection of MSS. received an addition of 104 Sanskrit MSS. purchased by Bábu Rájendralála Mitra and 4 MSS. copied for the Society.

The Photographic Album of the Society has received 2 photographs of Lushai arms and utensils from the Surveyor General's Office.

The English Agency of the Society has been transferred to Messrs. Trübner and Co. in place of Messrs. Williams and Norgate.

The want of proper accommodation for the Society's Library continues to be very severely felt and the Council fear that under the present state of things it will be in vain to hope for any increase in its prosperity or in the enlargement of its scope of usefulness. In reply to the application to Government for the sum of Rs. 400 monthly to cover the rent of the Society's house during the occupation of the present Building by the Indian Museum, the Society has been informed that the matter is under the consideration of Government, but it is confidently hoped that a favourable reply will soon be received.

Coin Cabinet.

During the year 19 silver, several Bactrian copper coins and 8 tin coins have been received as donations from members of the Society and others. 29 silver Bactrian coins have been purchased at Rs. 110 by the Society.

Journal.

About 400 pages of the Journal, Part I, have been printed during the year, and they have been illustrated by 16 lithographic plates. 300 pages of Part II have been published with 11 plates, and 212 pages of the Proceedings with 3 plates. The size of the Journal has been increased and the additional cost of the change has added considerably to the expenses under this head.

Bibliotheca Indica.

The Council have the pleasure to announce that the progress made in the publication of Oriental works during the past year has been in every respect satisfactory. The work done comprises 18 fasciculi of Sanskrit works, 6 fasciculi of Persian works (including a double number) and 8 fasciculi of translations from the Persian.

SANSKRIT.

The eighteen fasciculi of the Sanscrit Scries comprise portions of eleven different works; four relating to the Sama Veda, three to the Yajur Veda, two to the Atharva Veda, and one each to the Smriti and Chhandas.

Professor Mahesachandra Nayayaratna has completed the 4th volume of the Sanhita of the Black Yajur Veda, and is now employed on the fifth. The work comprises eight books, of which the first was edited by the late Dr. Roer, the second by Professor Cowell, and the major portion of the third by the late Pandit Ráma Náráyana Vidyáratna, on whose death the present editor took the work in hand. The last three books are short, and it is expected that one volume more will complete the undertaking.

Bábu Rájendralála Mitra has brought to a conclusion his edition of the Taittiriya Aranyaka, on which he had been engaged for the last seven or eight years. It extends to 928 pages of text, 77 pages of Introduction, and 56 pages of a Table of Contents. The Introduction gives a complete analysis of the work in English, and the table of contents notices the subjects of the mantras seriatim.

The Gopatha Brahmana of the Atharva Veda, which was originally undertaken by the late Pandit Harachandra Vidya Bhushana, and on his death made over to Babu Rejendralála Mitra, has also been completed. The editor has added to it an introduction in which the native characters and contents of the treatise have been described at length. The Babu has likewise completed his edition of the Pratisakhya of the Black Yajur Veda. An English translation of the work by Professor Whitney having already appeared, it has not been deemed expedient to attach to this edition an Analysis in English.

The Srauta Sutra of Sátyáyana has likewise been completed, and its editor Pandit Anandachandra Vedánta Vágisa is now engaged on the last fasciculus of the Tándya Bráhmana of the Sama Veda, which, it is expected, will be completed in a short time.

The Society's edition of the Pingila Chanddra Sutra and of the Atharva Upanishad of which one and two fasciculi, respectively, have been published, are also in a forward state, and will be brought to a conclusion during the current year.

The same cannot, however, be said of the Sama Veda Sanhita and of Chaturvarga Chintalani of Himairi. Of the former, altogether five fusciculi have been published, and this brings up the work to the middle of the 3rd chapter, or about one-fifth of the whole. The task is a difficult and trouble-some one, and several years must elapse before it will be brought to a conclusion. Of the latter, the first out of its four parts will be completed during the current year.

It has been observed by some European scholars that the works undertaken by the Society are not rapidly brought to a conclusion, and the great delay which has taken place in the printing of some of the works, to a certain extent, justified the complaint. But the voluminous nature of those works and the little time which can be devoted to their printing by the several editors engaged, who have all onerous official duties to discharge, render it impossible to press on our publications faster. The necessity of undertaking several works at the same time also apparently swells the list of incomplete works. Mutations in Indian society, so much more rapid than in Europe, and death, have likewise had much to do in checking progress; but on the whole, the Council is satisfied that, bearing in mind the large number of works which are in the press, and the limited resources at command, the Bibliotheca is progressing as rapidly as could be expected.

PERSIAN SERIES.

Of the Persian series, Mr. H. Blochmann has issued two fasciculi of the text of the Kin i Akbari (Fasc. XIV and XV). Fasc. XV completes the text of vol. I (600 quarto pages), and contains the first portion of an Index of about 4,500 geographical names of Upper India. About three fasciculi more will complete the text edition. He has also issued one fasciculus of the translation (Fasc. VI).

Maulawi Zulfaqar 'Ali has issued three numbers of the Farhang is Rashidi. The first volume of this critical dictionary of the Persian language is now completed.

Maulawi 'Abdurrahim, of the Calcutta Madrasah, has issued a full index of names of persons and geographical names occurring in the Society's edition of the Pádishahnámah. The index fills a double number, and renders, in the absence of a translation, the large work on Sháhjahán's reign more accessible. No work will in future be issued without carefully prepared indexes, and steps have been taken to prepare indexes to works issued in former years. The index to the 'Alamgirnámah by Maulawi 'Abdul Hai is about to be issued, three forms only being wanting. Maulawi 'Agha Ahmad 'Alí has his index to the Maásir i 'Alamgiri in press. Maulawi 'Abdurrahim has commenced the index to Kháfi Khán.

Two new works of importance have been commenced during last year, the text edition of the Akbarnámah, and the English translation of the Tabaqát i Náçirí.

The Akbarnámah by Abulfazl is the greatest astorical work that India has produced. It consists of three volumes, the first of which treats of the Timurides, up to the death of Humáyún; the second volume contains the most detailed account of Akbar's reign till 1011, A. A., when Abulfazl, at Jahángír's instigation, was murdered by Rájá Bir Singh Bundelá of U'rchah; and the third volume is the Ain i Akbarí. The edition

will also include the continuation of the Akbarnámah by 'Ináyetullah Muhibb 'Ali from the time of Abulfazl's death till the end of Akbar's reign (1014). Máulawí A'ghá Ahmad 'Alí of the Calcutta Madrasah has been appointed to dit the work, which will be issued in the same size and type as Mr. Blochmann's A'in. Two fasciculi have been printed. The edition is based upon nine MSS., belonging to the Society, the Fort William College, the Delhi MSS., and Maulawí Kabíruddin Ahmad.

The other new work is the translation by Major H. G. Raverty of the Tabaqát i Náçiri. This work is being printed in England by Major Raverty' himself. Two fasciculi were printed during the last year, and a portion of them will within a short time be received for distribution in this country. Major Raverty has sent the following report on the progress of his works.

'I have much pleasure in stating, for the information of the Council of the Society, the progress I have made in translating the Tabaqát i Náçiri, and other matters connected therewith.

'When I first offered a translation to the Society, as stated in my letter on the subject, I intended merely to have made a fair copy of a translation I had made of the portions relating to India, in connection with my own particular studies in Muhammadan and Indian History, which I have been engaged in for the last eight or ten years—from the Society's printed edition of the text, edited by Lieut.-Col. W. N. Lees, LL D. and his Maulawis, and a MS. in the India Office Library, which MS. and that belonging to the Royal Asiatic Society appear to have been the copies from which the printed text was taken, which printed text, in many places, is unintelligible and does not correspond with those MSS.

'Having, subsequently, discovered a very old copy of the text, and seemingly far more reliable, although defective at the end, and like all MSS-more or less defective in a few other places, on comparing it with the other named above, I found such considerable and important differences to exist between them, that I determined—even without "training a staff" for the purpose—to go over the whole translation again.

'Our friend, Mr. Arthur Grote, to whom I am greatly indebted for assistance in many ways, also advised that I should avail myself of any other copies of the text that might be procurable.

'In the preface to the printed text, the editor remarks—"When I commenced the work, we had three copies [of the Persian text], one belonging to the Royal Asiat Society, one in the India House Library, and ong to the High Priest of the Parsis at Bombay. A little while afterwards, Colonel Hamilton, in reply to a circular of the Society, forwarded a copy from Dehli. These MSS are all apparently good old copies, and are written in very different hands. It was supposed, then, that we had four distinct copies to collate; but before long, it became apparent that the four had

been copied from two MSS., so, in reality, we had only two * * * . The Society had issued hundreds of circulars to all parts of India, and had failed to draw out more than two copies; and the fact that the four old copies I had had been copied from two MSS, seemed to indicate so clearly the great scarcity of MSS. of this work, that I decided to go on."

'The editor's remarks are perfectly correct with regard to the India Office Library MS. and the Royal Asiatic Society MS.; for the mistakes contained in the former, are repeated in the latter exactly, even where two or three pages of the history of Mas'úd of Ghaznín are inserted in the account of the Saljuqs.

'Mr. Morley also mentions the Tabaqat as "a work of rare occurrence;" but, however scarce in India, it is not so in Europe.

'On instituting inquiry, I found the Bodleian Library possessed one copy, and that there were two others in the British Museum. These were not to be procured on loan, and there was no other course for me to adopt than to proceed to Oxford and to London, to collate them, although I somewhat doubted whether it would be well to put the Society to the expense attending these journeys; but Mr. Grote strongly advised me to do so. I first collated the Bodleian MS., a tolerably good copy, from Section VII, where I commence my translation, to the end of the work, line for line, and word for word. This completed, I went to London and collated the British Museum. copies-one, a very good one: the other, ordinary-in the same manner, and completed that task also. Altogether these labours occupied six weeks: and I regret to say that my sight has suffered in consequence.

'Having done this, I set to work; and six of the sheets were put in type, when our energetic friend, Mr. Grote, obtained the Hamilton MS. which copy of the text the Earl of Crawfurd and Balcarres was so very kind as to place at our disposal for six months; and, although it is not a very good cony, and defective at the end, it has been very useful. In the meantime, we had endeavoured to obtain the loan of two copies in the Paris Library, as it was impossible for me to go there to collate them; but after considerable delay, the favour was refused, on the plea that one was an autograph of the author's, and, therefore, could not be lent, and, that it would not be advisable to lend works of the kind to be taken out of Europe! I shall have something to say respecting this "autograph" hereafter, as I think I can put my hand upon three or four "autographs," equally authentic. I have had no difficulty, however, in obtaining collations, from those MSS., of passages which were at all doubtful, through the great kindness of M. Garcin de Tassy and M. Zotenberg. I find that they are, by no means, the most correct copies, and that even the "autograph" contains similar blunders to those of the India Office Library, and the Royal Asiatic Society's MSS., and likewise, the very great blunder of the author, which

occurs in every copy collated, which I have noticed at pages 160 and 165 of my translation.

At this time also, I heard from His Excellency State Counsellor Von Dorn, that the Imperial Public Library of St. Petersburg contained a copy of the text, and the Imperial Academy of Sciences, two copies; and, that, without doubt, I could obtain them on loan. I applied to His Grace, the Secretary of State for India for aid, which was graciously granted; and, through Lord Augustus Loftus, British Ambassador at the Russian Court, the Imperial Russian Government, in its proverbially enlightened manner, at once, most graciously, complied with my request; and the three MSS, were, without delay, placed at my disposal, the first for three and the last for four months.

'The Imperial Public Library MS., from all appearances, is, probably, even more ancient than the copy I have referred to in the third para. of this communication, for it is written in the style Mullis generally write, although correctly written. The dáls are marked with a diacritical point, and other letters are written in a peculiar manner denoting considerable antiquity. If either copy has a claim to be considered an "autograph," this is the one best entitled to it; but I am sorry to say that it wants great part of Section XVII, and all the succeeding Sections. One of the Imperial Academy's copies is a modern one, comparatively, but still exceedingly useful; but the other, only a little defective in one or two places, and at the end of the last Section, is an exceedingly good one, and is also of considerable antiquity.

'Having been so fortunate as to obtain these MSS., I determined to make the most of them, and also of Lord Crawfurd's MS., and laying aside the translation for a time, I collated these four copies, word for word, with the printed text [a specimen, after collation, I have sent to Mr. Grote to look at]; and with constant application, I completed that laborious task, and returned the MSS. within a day of the prescribed time.

'I found such difference to exist between the two best Petersburg copies, and the others, that I deemed it my duty not to have the proofs struck off, until I had made the corrections and emendations, which, as shown by them, were absolutely necessary: hence the extra cost of corrections for the first six sheets of the translation, which the Honorary Secretary has noticed in his letter, No. 365 November 8th, 1872. This extra cost, I regret; but, I hope I shall be considered justified in adopting the course mentioned.

As to the printed text I must say, with regret, but conscientiously, that it is almost useless: there is scarcely a correct page in the book. But, when I consider that it was taken from two very incorrect copies of the original, it is not to be wondered at, and it was impossible it could be other-

wise. Even as it is, after collating so many copies, the editing and reprinting of a correct text would be, by no means, a light or an easy task.

'It will be observed that I have commenced the translation from Section VII., and from that Section, it will embrace the whole work. The first six contain—I, an account of the Prophets, Patriarchs, etc., the ancestors of Muhammad, and his life; II., III., IV., the history of the Khalifahse; and VI., the kings of Yaman. All these are of very little importance. The Vth Section is somewhat more important, and relates the history of the early Persian kings, but also contains so many errors, that a volume might be filled with notes to correct and explain it, and, therefore, I determined to omit it. I can give a brief resumé of the contents of those Sections to precede Section VII, on completing the translation.

'My references to Elliot's India are not directed, of course, to the whole of that work, but, merely to those portions of the Tabaqat i Naçiri contained in it, which appear to have been taken chiefly from the printed text, and consequently very considerable differences will be found to exist between that translation and mine, which I have endeavoured to make available for the general reader, and not for scholars alone.

'I do not expect there will be many typographical errors—even of a minor nature—but of such as may be found to have crept in, I will, on completion of the work, give a list, with the Index and title page.

The long and unctuous adulations addressed to, and the constant prayers offered for, the "Sultán of the Sultáns of both Turk and 'Ajam," to whom the author dedicated his work, have been generally omitted or greatly reduced, and some of the introductions to Sections also, which are in a similar style, have been cut short, but in all other cases, I have not "compressed" the translation in the least degree, and I may say that I have weighed every word and sentence, and have omitted nothing, not even the poetical quotations. I may have to compress some of the longer poetical extracts, if of no particular merit or interest, but not otherwise.

- 'I have noticed a very remarkable difference in the mode of expression in scores of places—the signification the same, but so very differently expressed—so much so, indeed, as to give one the idea that the Persian text must be a translation from another language. I have only space to mention this briefly now, but hope to do so in my prefatory remarks to the whole work, when complete.
- 'Although the notes are numerous, and some somewhat long, I think it will be found that they were necessary to correct the author's incorrect statements, and the serious blunders he often makes. I may truly say "I have neither spared time nor labour, in endeavouring to make the translation acceptable to the Society and the public.
 - · 'I cannot close this report without referring, briefly to the kindness

and assistance I have hitherto received from various scholars; and trust, when my labours shall have been brought to a close, to acknowledge them more particularly, and in suitable terms.'

The following are the names of the Sanskrit works issued during the last year—

The Sañhitá of Black Yajur Veda, with the Commentary of Múdhava Achárya, edited by Pandit Mahésa Chandra Nyáyaratna, Nos. 229 and 230. Fasc. XXV and XXVI.

The Sáma Veda Sañhitá, with the Commentary of Sáyana Achárya, edited by Satyavrata Sámasrami, Nos. 211 and 251, Fasc. IV and V.

The Chaturvarga Chintamani by Hemádrí, edited by Professor Bharatachandra S'iromani, Nos. 245, 257 and 262, Fasc. IV—VI.

The Gobbilya Grihya Sutra with a Commentary by the Editor, edited by Pandit Chandrakánta Tarkalánkúr, No. 241, Fasc. III.

The Goputha Bráhmana of the Atharva Veda, edited by Bábu Rájendralala Mitra, No. 252, Fasc, II.

The Atharvana Upanishads with the Commentary of Náráyana, edited by Rámamaya Tarlálankara, Nos. 219 and 265, Fasc. I and II.

The Taittirya Prátisákhya with the Commentary entitled Tribháshyagatna, edited by Bábu Rajendralála Mitra, Nos. 253 and 259, Fasc II and III.

The Tándga Mahábráhmana with the Commentary of Súyana Achárya, edited•by Paṇḍit Anandachandra Vedantavágis'a, Nos. 254 and 256, Fasc. XVII and X♥III.

The Chhandas Sútra of Pingala Achárya with the Commentary of Halayudha, edited by Pandit Vis'vanatha Sástri, No. 258, Fasc. 11.

The Srauta Sutra of Latyina with the Commentary of Agni Svami edited by Pandit Anandachandra Vedántavagís'a, No. 260, Fasc. 1X.

The Taittirya Aranyaka of the Black Yajur Veda with the Commentary of Sáyana Achárya, edited by Bábu Rájendralála Mitra, No. 263, Fasc. XI.

The following are the Persian works issued during the last year-

The Ain i Akbar by Abul Fazl i Mubarak i'Allami, edited by H. Blochmann, M. A., Nos. 248 and 264, Fasc. XIV and XV (partly index).

The Furhang i Rashidi by Mulla Abdur Rushid of Tattah, edited and annotated by Maulawi Zulfaqar 'Ali, Nos. 250, 255 and 266, Fasc. VI—VIII.

The Index to the Padishanamah by Maulawi 'Abdur Rahim, No. 261 (double number).

Translations.

The Ain i Akbari of Abul Fazl i 'Alldmi, translated in English by H. Blochmann, M. A., No. 247, Fasc. VI.

The Tabaqát i Náçiri of Sirájuddin Minháj, translated into English by Major H. G. Raverty (printed in England) Fasc. I and II.

Officers.

The duties of the Secretaries were performed by Dr. F. Stoliczka and Mr. Blochmann till June, when Captain J. Waterhouse was appointed General Secretary and has since that time edited the Proceedings, conjointly with. Dr. Stoliczka and Mr. Blochmann, who have retained charge of the Natural History and Philological parts of the Journal respectively.

The office of Financial Secretary and Treasurer was held by Col. J. F. Tennant till the month of February when Col. Gastrell resumed charge of it.

The Council have again much pleasure in recording their satisfaction with the good services of the Assistant Secretary, Bábu Pratapehandra Ghosha, B. A., they have also favourably reported on the work done by Bábu Manilál Baisak, Assistant Librarian, Sayyid Waliullah, store-keeper, and Babu Buddinath Baishak, Cashier.

LIST OF SOCIETIES AND OTHER INSTITUTIONS WITH WHICH EXCHANGES OF PUBLICATIONS HAVE BEEN MADE DURING 1872.

Batavia :—Société des Sciences des Inderlandes. Berlin :-- Royal Academy. Birmingham :- Institution of Mcchanical Engineers. Bombay :- Royal Asiatic Society. Boston :- Natural-History Society. Bordeaux :- Bordeaux Academy. Buenos Ayres : -- Public Museum. Bruxelles:—Académie Royale des Sciences, &c., de Belgique. Cherbourg: --Société Impériale des Sciences Naturelles. Calcutta : -- Agricultural and Horticultural Society of India. ----: Tattvavodhini Sabhá. -----:--Geological Survey of India. Christiania: - University. Dacca :- Dacca News and Planters' Journal. Dera :- Great Trigonometrical Survey. Dublin: - Royal Irish Academy. -:-Natural History Society. Edinburgh :- Royal Society. . Lahore: -- Agricultural Society of the Panjab. Leipzig :—Deutsche Morgenländische Gesellschaft. Liège :- Société Royale des Sciences. London :- Royal Society.

Bábú Rájendralála Mitra.
The Hon'ble Sir R. Couch, Kt.
T. Oldham, Esq., LL. D.
Dr. F. Stoliczka.
H. Blochmann, Esq., M. A.
The Hon'ble J. B. Phear.
Col. H. L. Thuillier, R. A., C. S. I.
J. Wood-Mason, Esq.
Captain J. Waterhouse.
Col. H. Hyde, R. E.
The Hon'ble E. C. Bayley, C. S., C. S. I.
Rajah Jotendramohan Tagore.
W. L. Heeley, Esq., C. S.
L. Schwendler, Esq.
Col. J. E. Gastrell.

Members of Council.

Colonel Thuillier said—" With reference to the Annual Report which we have just heard read, I think it will be apparent to the meeting, that the Society is greatly indebted to our worthy office-bearers, the Secretaries and Treasurer, who have so persistently devoted their time and talents to the interests of the Society. Whether we look at the remarkable punctuality with which the Journal of the Society is published, or consider the various ways in which the Secretaries maintain the reputation of the Society, and the Treasurer our financial interests, our warmest thanks are eminently due to these gentlemen.

"It is right to remind the meeting that the sole reason of Captain Water-house being appointed General Secretary was to relieve Messrs Blochmann and Stoliczka of some part of their various duties, at their own special request, in order that they might be better able and have more time to attend to their respective departments in the Philological and Natural History branches, which they still so admirably fill. By the valuable assistance of my excellent friend, Captain Waterhouse, I have no doubt the various duties of editing the Journal and other matters connected with the Society will be even better performed than heretofore.

I have therefore great pleasure in proposing a cordial vote of thanks to Messrs. Blochmann, Stoliczka, and Cappain Waterhouse, the Secretaries, and Col. Gastrell, Treasurer."

The proposal was seconded by Dr. Waldie and carried unanimously.

The following gentlemen were elected to audit the accounts for 1873: Messrs. L. Schwendler and F. W. Peterson.

The President then read the following address.

PRESIDENT'S ADDRESS.

Gentlemen,—Another year has passed, and the recurrence of our anniversary reminds us of the propriety of taking stock of our progress, and ascertaining our exact position.

It will be needless to repeat the numbers so clearly given in your Council's report, or to detail the various changes in resident and non-resident members. It will be sufficient to refer to these details, and to state the broad result that the Society is not, pecuniarily, quite as well off as at the close of last year, that the amount of subscriptions realized has not come up to the estimate, and that the year has closed, leaving charges against the income of the Society for 1873, which properly should have been paid out of the income for 1872. We fear that this will continue to be the result of the working of the Society so long as we are huddled together into the corner of our noble house, without room even to store our books, and with all our property deteriorating rapidly, from the impossibility of properly attending to it.

The Society is fully aware from the addresses of previous Presidents, that we hold that we have a just claim for redress of these wrongs and injuries as against "the Government of the country who, voluntarily and in the most solemn manner supported by all the formalities of a regular act of the legislature entered into a contract with the Society to provide ample accommodation for that Society on a certain date, the Society meanwhile allowing the collections, which they handed over to the care of the Government officers for the public benefit, to remain in the house they then occupied, and still occupy. This house and grounds are the undoubted property of the Society-• they are in no way whatever subject to the control of Government in any one of its departments. And the Society has therefore from the date settled in the contract I have alluded to, been deprived of the rent which they could have at once realized for this house, from that date up to the present time, and they have further been mulcted, by the non-performance of their part of the contract by the Government of the country to the extent to which their property has been left so long without repair, and without renewal, which could not be satisfactorile done while crowded with collections, until now portions of it are unsafe, and in any case the serious cost of repair will absorb a very large sum. This just claim for the payment of a rent for the House they have occupied, for years after the stipulated time, had been as you are aware submitted to Government. The Society has not received a definite reply although more than two years have elapsed. The Council at the Society have endeavoured in every justifiable way to smooth the

path to a settlement, and more recently they have preferred to let the matter rest without further movement, because they felt so thoroughly convinced of the strict justice and unquestionable correctness of their claim, that they felt certain that time alone was requisite for a favourable solution of the difficulty. This claim is so strong that its strict legality has been maintained by several of the Judges of the High Court of Judicature, and to maintain it, in a legal way, it was only necessary to close our doors and to refuse the use of our house and so prevent the destruction caused by the hundreds which daily throng its halls. But, as I have said, the Council preferred endeavouring to obtain their just rights by quiet efforts to maintain the position of the Museum, while not in the least abandoning their claim. This they never will abandon; they seek no grant-in-aid of their efforts in promoting the spread of knowledge in the country, although this also they might fairly expect to receive; they ask no dole of charity to help out their existence, though the grant of such assistance would but honor the giver more than the recipient, for science has ever been the best handmaid of Government. But we maintain a just claim to the payment of certain sums, due to us under a solemn contract, and fairly and properly earned as it were by the Society, by the noble collections which they had brought together and maintained even often at the risk of their own existence, and which they handed over for the public benefit. Surely the public is bound to acknowledge this value received!

Let us look at it in another light. What was the value of the collections handed over! It is almost impossible to put a money value on collections of this kind. The number of specimens gives no clue to it, their value depends much more materially on other considerations. Our collections contained all the typical and original specimens of Blyth's wonderful contributions to the Natural History of this country, those of Bryan Hodgson in numerous departments, many of Jerdon's specimens, many of Buchanan Hamilton's: large series contributed from other countries identified by the original describers and contributors. It contained a noble series of Sewalik fossils all of which had been carefully examined by Dr. Falconer himself, and carefully catalogued. And it also contained a very extended collection of objects representing the fauna of this country from various sources. Such a collection could not have been obtained anywhere else for any money. And I have no hesitation in saying that had it been put into the market and offered for sale, it would have readily realized a sum of two and a maif lakes of rupees. Take even less than this sum at five per cent., and the Society would have had an income of 10,000 Rs. per annum, or more than 800 Rs. per menth! And this I would add, with their house unincumbered and free for the presecution of their own immediate objects. Gentlemen, it may suit the views of some who seek possibly the aggrandizement of their own position, or to

enlarge upon their own contributions to such collections, to depreciate the value of the Asiatic Society's collections. But I speak with a full knowledge of the feeling of true naturalists, and true palæontologists, when I say that such a storehouse of the accumulated facts of generations, such an accumulation of original species, of the absolute labours of the great workers in the Natural Sciences, was simply invaluable.

Gentlemen. I have dwelt upon this subject, although for many reasons I would have greatly preferred to pass it over in silence, because I have been made aware that a most erroneous, and strangely erroneous, idea prevails in certain places, that the Government of the country contributes largely towards the Asiatic Society's support. It is needless to tell you, as the members of the Society, that this is not so; that we do not in fact receive one single pice of the public money as income of the Society, and have not for many years past. We acknowledge with thankfulness the liberality with which on some occasions, when special wants were represented, the Government have aided the Society, but none of these have occurred for years past. We acknowledge that for years when unwilling to adopt other and better means of exhibiting to the people of this country the resources of the land in which they dwelt, the Government maintained, at a rate of remuncration on which a decent clerk in an office would be supposed to starve, a Curator to take charge of collections to which the Society gave, free of all charges, room for exhibition and study, and also contributed the same small stipend to the support of a man of wide European reputation, and who had devoted a lifetime to the Natural History of the country. But contributions to the Society, for the objects of the Society proper, there have been none.

A sum of 6,000 Rs. per annum is now passed through the hands of the Society as Trustees for the publication and issue of the Bibliotheca Indica, a noble and invaluable series of the standard vernaçular literature of the country; and one which well repays the limited outlay of 600£ a year. But the grant of this sum gives not one pice to the Society. It gives a very large amount of trouble, anxiety and responsibility, which are voluntarily borne by the Philological Committee and Council of the Society, rewarded only by the consciousness that they are doing good. But as I have said, not one fraction of this grant goes to the Society. The accounts are kept most strictly separate, as any one can satisfy himself by a more reference to the accounts of the Society.

I refer also to this for another reason because I find in some Statistical returns of Educational and Scientific institutions recently issued by the Government of Bengal, the Asiatic Society is set down as possessed of an smdowment of 190 Rs. per year. Now the facts of this were fully explained to the compiler of the tables, and I cannot understand how with

these facts before him, this statement should have been allowed to go to the public. This so-called endowment, gentlemen, is the interest on a few thousand rupees which the Society itself has invested in the funds of the country, the result chiefly of accumulated entrance fees of its members. It is just as clearly a part of the ordinary income of the Society as is the subscription which I, as an ordinary member, am called upon to pay annually, and can be dealt with by the Council in exactly the same way. It would indeed be well for the Society if it had an endowment even of small limits. And we shall feel indebted to the author of the tables or any one else, if he will establish such an endowment. But when such does not exist, the statement of it is likely to lead to serious misapprehension of the position of the Society.

We rest, therefore, in the perfect confidence that the just and undoubted claim of the Society for remuneration for the heavy damages inflicted on the Society by the continued occupation of their premises and the consequent depreciation of their property,—in addition to the injury done by keeping the Society in a position in which it can hope for few additions to its numbers, and can offer but little advantages to its working members,—that this claim will be acknowledged without further demand, and that the Society will be freed from the heavy incubus under which it now rests.*

During the year, the Society has lost by death eight ordinary, one honorary and one corresponding member. Among these were some distinguished in the ranks of science, and long supporters of our Society.

The year had scarcely opened, when we were, in common with every well-wisher of the country, stunned by the fearfully sudden and awful death of the Viceroy, our Patron. It was not within the scope of the Asiatic Society's objects to discuss the many political questions which had more immediately engaged Lord Mayo's attention, but we could not fail to appreciate the earnest and thorough heartiness of Earl Mayo's character, or to feel profound regret at his being cut off in the very height of a successful career by the hands of an assassin.

Lord Northbrook, his successor, has been pleased to accept the office of Patron of the Society, left vacant by Lord Mayo's death.

• It is with the sincerest pleasure, that I am able to stop the printing off of these pages, and announce that the Government of India have after careful consideration, shoeded in full to the claims of the Society. This is peculiarly gratifying, to the Council of the Society, who have found themselves in the painful position of apparent opposition to the Government of the country, while, after the calmest and most unprejudiced consideration they could give to the subject, they found their convictions of the justice of their claims so strong that they were unable to retreat one single step. They feel, therefore, most thankful that any further difference of opinion has been thus removed.

In Dr. Jerdon, the Society has lost an old and well-tried friend and fellow-labourer. It is now more than thirty years since his 'Catalogue of the birds of the Peninsula' was published in the Madras Journal for 1839. And the numerous papers which he has since published in that Journal and in the Journal of our own Society shew that his interest in this subject had never ceased. His 'Illustrations of Indian Ornithology' was among the earliest attempts at proper coloured figures of Indian Birds. His labours may be said to have culminated in his well known and oft quoted 'Manual of the Birds of India,' followed by his 'Game Birds of India.' Even after he had retired from active service, and left the country, his first desire was to publish a supplement to this valuable work, which he largely succeeded in doing by a series of papers in the 'Ibis.' Indeed it is a proof of how entirely his heart was wrapped up in the subject, that he was talking with his friend, Drescher, of the 'Birds of India' until within a few hours of his decease, not conscious of the danger that was impending over him.

Nor did he, while thus devoting his attention chiefly to birds, neglect the other classes of Vertebrata. He had conceived the noble idea of furnishing students of Indian Natural History with monographs of each of these classes, which he accomplished so far as the Mammalia were concerned. Reptiles also had engaged his earnest attention for years, and were the subject of an active and extensive correspondence with Gray, with Cantor, and Blyth. Our Journal contains a catalogue of the Reptiles of the Peninsula of India, which shews how desirous he was to attain accuracy in his determinations, and since the publication of the Mammalia and Birds he had been most assiduously collecting Reptiles, and indeed the first portion of his monograph on the Reptiles of India was actually printed. I should notice also his very valuable catalogue of Fishes, in the Madras Journal, while in a different branch of Natural History entirely, his descriptive account of the Indian Ants is one of the best yet published. He had contributed to Benson and Blanford many shells described by those writers, while many entomologists in India can point with satisfaction to valued specimens of beetles and butterflies for which they had been indebted to Jerdon's liberality. To all this range of natural knowledge he added a wide acquaintance with Botany and the plants of India, especially the ferns.

Most of this work had been accomplished while Jerdon was in active service with his regiment, and dependent on his own resources for books, specimens, &c. for comparison. Gifted with remarkable powers of conversation, and with his memory richly stored with anecdotes of others, and observations of his own, he was a charming companion, while his untiring energy, and been sense of personal enjoyment, were absolutely infectious.

Jerdon has left behind him an immense store of valuable notes, and of coloured sketches from life, which we hope and trust may still be utilised.

With less originality perhaps than either Blyth or Bryan Hodgson, he has yet done more than any other individual for the Natural History of India, by his valuable Manuals. And it is much to be wished that the series may be completed and brought up to date by some of his successors. Dr. Jerdon was an officer of the Madras army, and although in the course of his military service he had visited parts of Central India, it was not till late in his career that he had an opportunity of visiting and enjoying the glorious scenery of the Himalaya, which he did with a peculiar freshness and keenness of delight.

Sir Donald McLeod was one of the oldest members of the Society. He joined our ranks in 1837, more than the third of a century since, and since that, has been an undeviating friend and supporter of the Society, taking the liveliest interest in every step that marked its progress, or that tended to improve our knowledge of the peoples of this country and their history. He was not an active contributor to our Journal, but was always an earnest supporter of science, and an able and disinterested adviser on all points. Of unbounded hospitality, which was exercised with a simplicity of courteousness and thoughtful kindness, which led all to look to him as a friend, of the widest and purest sympathies, Sir Donald McLeod possessed the singular power of attaching to himself all with whom he came in contact; a power, which gave him a command over his fellow men, due rather to the influence of his individual character than to the grasp or power of his intellect. He was in fact a singularly loveable man, and will ever be remembered by those among whom he lived so long, and over whom he had exercised a benevolent sway for years, as a friend and benefactor. • The Society will feel his loss as an earnest and enlightened promoter of sound education.

During the year we have also lost in Mr. C. Horne, C. S., a valued contributor of several Archeological papers to our Journal. He came to India at the age of 20 in 1843, and finally returned to England in 1869. He had been a member of this Society since 1863 up to the time of his death last year.

. • Colonel Sykes, whose connection with India dated almost from the very commencement of the century, had ever been an earnest cultivator of the Natural Sciences, and as Director of the East India Company a steady and warm supporter of every effort to promote the welfare of this empire. He had contributed to various journals many very excellent papers on the Geology, Ornithology and Meteorology of India.

From among our corresponding members, one name of high note has been removed by death. Theodore Goldstücker, who died in March 1872, at the early age of 51, was a native of Königsberg. He commenced the study of the Sanskrit under Professor von Bohlen, at an early age. He also studied the Hegelian philosophy under Rosenkranz. At Bonn, he continued his

studies under Schlegel and Lassen. His first publication was the Prabodha Chandrodaya, which appeared in 1842. He proceeded to Paris from Bonn and then became a pupil of Eugène Burnouf, and later he paid a short visit to England. In 1859 he was invited by Professor Wilson to come again to England and assist in the preparation of a new edition of his Sanskrit dictionary. He undertook the revision, but under his hands it became so vast an undertaking that only six fasciculi, containing the greater portion of the first letter, were published. A few years after his arrival in England, he was appointed Professor of Sanskrit at University College, London. In 1861, he published his essay on Pánini, as introductory to a facsimile edition of the Mánava Kalpa Sútra. He also carried through the press for the Indian Government a photo-lithographic facsimile of the Mahábháshya which is nearly complete.

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Dr. Goldstücker was elected a corresponding member of this Society in 1863.

A general review of the work done by the Society during the year will I think show that there has been no diminution of zeal, no want of earnest and thoughtful work.

The issue of the BIBLIOTHECA INDICA, which the Society have voluntarily undertaken to edit on behalf of the Government which supplies the necessary funds, has, on the whole, progressed very satisfactorily. I feel bound to allude to this subject rather more pointedly than otherwise I should feel justified in doing, because during the year some critical remarks have issued from the pen of one at least of the ablest orientalists of Europe. Prof. Weber in a review of the labours of the Society in connection with the Bibliotheca Indica, as extending from 1865 to 1870, acknowledges in a hearty manner the judicious selection of works for publication, and fully admits that the several editors, principally native scholars, have truly performed all that could have been at all expected from them. In truth, Professor Weber speaks only in terms of praise and approval, of the works selected and the mode in which they have been edited. But his objections are based, I may say almost solely, on the delays which have occurred in the issue of successive parts or . fasciculi of various works which extend over many pages. Now, no one can be more thoroughly alive to the force of this objection than the Philological Committee of the Society, under whose special charge these publications are. But I fear Professor Weber's experience of the conditions of literary work of this kind in Europe, and in the midst of the learned centres of literary activity, where he resides, scarcely enables him to realize the almost unspeakable difficulties which accompany the effort here. There is not among the long list of editors of our Bibliotheca, one single person who has not heavy and centinuous official duties to perform which occupy by far the larger portion of his time, and which give none of that literary ease, so essential te

the satisfactory pursuit of such studies. Heavy critical work requiring constant thought, and much accuracy of comparison can in this country only be taken up, after the mind and after the body too are fatigued and jaded. And the wonder really is, that so much can be done as has been, not that more has not been accomplished. And further, the conditions of society here which lead to much more rapid changes than elsewhere, tend to retard, if not altogether to interfere with or interrupt, the progress of such editions. In many cases, the editors who have commenced the publication of works in this valuable series, have been carried off by illness, and new editors had to be sought out. In some cases owing to these causes, successive portions of the same work have been entrusted to the care of three and four different scholars. Every such change inevitably involves delay. Time is required to seek out a new editor; he must fully acquaint himself with what has been done and what he is to continue and so months, and even years, pass over before the work can be satisfactorily resumed. I know of one case in our experience in which with all possible anxiety to publish as quickly as possible one of the most valuable remains in Hindi, the negotiation for editing the work has extended over years and nothing definite is, I believe, yet adopted.

But further, owing to the necessary delay in the transmission of these fasciculi to places in Europe, Dr. Weber, in common with others, complains of the irregularity with which the fasciculi are received. This is a grievance under which we suffer in this country quite as much as European scholars can possibly do. The delays in the transmission of books are most vexatious and destructive to progress. But unquestionably these are not chargeable to the Society, for every care is taken to despatch as quickly as practicable the successive fasciculi.

Of the several works noticed as still incomplete the past twelve months have seen the conclusion of some. The Taittiriya Aranyaka, on which Babu Rajendralála Mitra has been engaged for the last seven or eight years has been completed, forming a volume in all of considerably more than 1000 pages! It is accompanied by a complete analysis of the work in English, and a valuable table of contents. The Gopatha Brahmana has also been completed by the same editor after it had been in the hands of another scholar, whose death interrupted his labours. In this also, an introduction is given describing at length the nature, character, and contents of the work. Another work of high value completed during the year has been the Pratis akhya of the Black Yajur Veda. For this, the preparation of an analysis in English was considered unnecessary, as Professor Whitney had already published a translation.

The S'rauta Sútra of Lathyana has likewise been completed, and the leaves ed Pundit who has edited it, gives promise of the Tandya Brahmana of the Sama Veda, which he has undertaken. It is hoped, with heme confidences.

that the Atharvana Upanishad, and the Pingala Chhanda Sútra, will both be completed in the current year.

The fourth volume of the Sanhitá of the Black Yajur Veda, has also been completed, and the fifth is in hand. Of the eight books constituting the work, the three which now remain are short, and another volume will probably suffice to complete the whole. We are more disposed to feel gratified at having been able to advance this important work, so far as it has proceeded, under the difficulties attendant on its publication, than to be dissatisfied with the time occupied. The first book was edited by the late Dr. Roer, the second by Professor Cowell who then left this country, and the greater portion of the third by Pandit Ramanáryana Vidyáratna, and, on his death, it was taken up by the present editor, Professor Mahesachandra Náyaratna.

It will not be necessary to vindicate the Society from charges of delay and neglect with regard to its Arabic and Persian issues which are acknowledged to be progressing with favourable speed, and to contain the most valuable historical works known to exist. And the principle on which the Society has acted of confining their publications to works bearing on India meets full approbation.

In connection with these subjects, I would myself as one not having the slightest pretension to such a knowledge of oriental languages as would justify my offering an opinion on the style in which these various works have been issued, express the gratification which I feel at finding scholars like Professor Weber, admitting fully the value of the series, and acknowledging the ability with which they have been conducted. But I would go further and fenture to urge on those learned scholars who are so actively engaged in these pursuits, and who have been for years earnestly and actively endeavouring to make known to the world the rich stores of literary wealth which this country offers for utilization, whether the publication of translations into English accompanied by notes illustrating from other sources the text of their authors, would not gain for them a far wider and more numerous audience, and would not tend to advance very importantly the knowledge of their authors by bringing to their illustration the varied acquirements of others.

As an instance of how much knowledge can be brought to bear upon a single text, of what a flood of light can be thrown upon a single phrase even, I would ask any one to study Yale's marvellous edition of Marco Polo, which though not issued within the year under review may serve as an instance of what one would desire to see done, in a very minor degree, towards the illustration of some of the great national works the text of which is given in the Bibliotheca Indica. I am not sanguine enough to hope that many, if indeed any, may be found who could bring to their subject such a varied range of reading, so large and almost unlimited a stock of acquired, and still mere

wonderfully systematized, facts, such quaint and curious illustration derived from the most unexpected sources, and yet most aptly and charmingly brought to use. Nor can it be, that many will be found capable of conveying all this information with such a charming simplicity of language or with such a force and power of description, that fragmentary as the whole is, one is unable to lay down the book when once commenced. But much would undoubtedly be gained, while more information than can be obtained elsewhere would be made accessible to all.

In connection with this subject, I am myself aware that for many years our able Secretary Mr Blochmann has been bringing together from every source opened up to him in the course of his extended study, a complete index to all geographical names mentioned in these oriental works. This 'Index Geographicus,' will be—if it ever see the light as we hope, and trust it will,—a glorious mine of knowledge charged with ore of the richest quality, and of the brightest and purest kind, and will really throw more light upon the changes, historical and political, dynastic and geographical, which have passed over this land, than any single collection that I can think of. Col. Yule has I rejoice to say undertaken to prepare for publication, and has far advanced in the work, a Manual of the Geography of India, which I have no doubt will contribute very largely to our acquaintance with the subject. He has indeed during the past year, given us a foretaste of the pleasure we are certain to derive from his labours, by a most masterly essay, introductory to the new edition of the travels of Captain Wood to the source of the Oxus. I would gladly dwell on this subject for a little. The district calls up every fanciful picture of Eden which may have joyed our childhood, and here we find all primeval tradition combining with all modern theory and knowledge, pointing out the cradle of our race, and the site of the Adamic Paradise, while its past history is interwoven with that of all the great Asiatic conquerors, and its coming history 'looms on the horizon rife with all the possibilities suggested by its position on the rapidly narrowing border-land between two great empires, one of them our own.'

. • But the wide range of the subject, and the value of Col. Yule's exhaustive interpretation of all available evidence bearing on it, would take up far more time than can now be spared. I would, however, commend this essay 'On the geography and history of the regions in the upper waters of the Oxus,' to every one who takes an interest in the early history of the country and of the many changes which have passed over it.

In connection with these publications of the Society and others, we may perhaps take a glance at some other publications bearing on the Archeology of India. The Journal of the Society for the past year will be found right in such information. We have descriptions of the antiquities of Barantpur, Bindrabun, Gokul, Benares, Jaunpur, Bengal and parts of Quisa. And

before all others, the masterly account of Bihar by Mr. Broadley, containing a mass of accurate description and information, the result of most zealously conducted researches and excavations. During the year also we have had the reports of General Cunningham, the Archæological Surveyor, detailing his researches during the seasons of 1862 to 1865 and affording a rich treasure of historical and other information regarding the districts visited, Behar, Gya, Tirhoot, &c., with a full discussion of the accounts of Fa Hian and Hwen Thsang. The second year was devoted to Delhi, Mathura, Kanauj, Allahabad, Ajudhya, &c. The third year's report takes up the Punjab and its' ethnology and antiquities, while the fourth discusses the history of Jaipur, Ajmere, Gwalior, &c. A portion of these reports originally appeared in the Journal of this Society, but without the many and valuable illustrative plans and drawings which now accompany them. The work, in two goodly-sized volumes of more than 500 pages each, forms a convincing proof of the justice and wisdom of Lord Canning in first appointing General Cunningham to this task, and shews too what an almost exhaustless supply of valuable information bearing on the history, the architecture, the dynastic divisions and the geographical features of the country yet remains to be worked out. is no question that many of the views put forth will be subject to modification and change as knowledge increases or more extended research is made. But this is the case in every such enquiry and in no way detracts from the value of these interesting reports.

Another work published, or at least received in India, during the year treats of another and very interesting part of the archeology of the country. The rites of sepulture, the curiously varied and complicated ceremonies observed by some people, and the simpler ritual which marks the proceedings of others give a special interest to all remains of the ruder monuments which in many countries mark the localities where the great dead have been interred. or their ashes entombed. Mr. Ferguson, to whom Indian archæology is so largely indebted, has given us a very full and satisfactory account of these rude stone monuments in all countries and among others in India. The portion of his work bearing on India, is by no means so full or satisfactory as other, parts. But seriously deficient as it is, it gives an approximation to the state of knowledge on the subject, which will be of vast use. Indeed the real value of all such general treatises consists in this, that they indicate the boundary between the known and the unknown, and enable students to start from the advanced posts of existing knowledge without wasting time in preliminary investigation, or going over ground which had been fairly examined before; and in this point of view, such works as Ferguson's are of high value. the very facility which they give ought to lead to early refutation or confirmation of their statements. Such sweeping assertions as that these rude stone monuments do not exist in the valley of the Ganges or any of its tributaries, could be so readily disproved, (and indeed it has been) that there is no excuse for allowing it to remain before the world as a statement of facts. But I would hope for much more than this, and ask every one who has an opportunity of seeing such monuments to figure them and give a careful description of them, so that not only their mere existence, but all their peculiarities may be known.

Another work on Indian Ethnology and the habits and customs of the races inhabiting Bengal as the province is known now, which appeared during the year, is the splendid volume of Dalton's descriptive Ethnology. This was brought out at the cost of the Bengal Government, under the immediate supervision of the Council of this Society, and it is certainly one of the most admirably illustrated, as well as printed, books yet issued from Calcutta presses. But it has higher claims on attention than the mere get-up of the book. Col. Dalton has here given not only the information which he was able to obtain from others, but has told us in plain nervous language, and with a keen appreciation of humour throughout, his own experience with the wild tribes and peoples among whom his long service in India has almost exclusively been passed, and who have learned to know him so well, and knowing him to trust him so implicitly, that they who would flee in terror from other white faces come to him as an intimate friend and play with him as a loving child would with a revered parent. Indeed one of the great charms of the book is the insight you get into the true basis of these relationships of intercourse and friendship which have existed for years between the writer and 'his children.'

Descriptions ranging over such a wide circle of races could not be anticipated to be equally detailed or equally accurate in all. But if blemishes occur I hesitate not to say that those who read Col. Dalton's descriptions will rise from their perusal with enlarged information, and with matured sympathies. I would even suggest to the author whether he would not think of publishing a smaller and cheaper edition, taking advantage of any additional information which may have cropped up since, and using fewer illustrations thus rendering the work accessible to a much larger circle of readers. I must add that great credit is due to the Government of Bengal for the liberality with which it has enabled so nobly illustrated a volume in the ethnology of its provinces to be published.

In addition to the truly valuable series of descriptive papers on the antiquities and history of various places in India, we have in the Journal for the past year some curious coins illustrated, and notably a fine series of inscriptions of various dates, from some nearly five centuries old, down to last bentury and many throwing rich light on historical facts. It is hoped that this valuable series of the inscriptions may be continued, for General Cunningham has placed in our Secretary's hand, for decipherment and publication.

all his unequalled collection of these records. It may be noticed as a curious illustration of the value of such, even when apparently so placed that they must be tolerably known, that an inscription, which records a king in Bengal hitherto entirely unknown, was brought from the well known town of Kalnah on the Hooghly, where it must have been seen by thousands of visitors, none of whom ever thought of deciphering or taking a rubbing of the inscription! A rich store of facts, both historical and chronological, will doubtless be opened up by the careful examination of such inscriptions, and in no one's hands could the task have been placed with higher prospects of success than in those of Mr. Blochmann.

Under the garb of a small School Manual published by the School Book Society, Mr. Blochmann has also given to the public one of the best and most complete Manuals of the Geography and geographical statistics of India, which has yet appeared. The information is derived from the most recent sources, and is not a mere reprint or compilation of the obsolete statements of Thornton and others, and in the small space of a little pocket volume, it contains an immense amount of condensed information bearing on the area, position, population, antiquities, history and general relations of all the divisions of the country.

If we turn our attention now to the division of our sciences represented by the second part of the Journal, I am justly able to congratulate the Society on a most fruitful and successful year. Dr. Day has continued his admirable Catalogue of the Indian Cyprinidæ, of which this year has given us three fasciculi. He has also described the fish collected in Kach'h by Dr. Stoliczka and discussed the relation of some of the genera of the Siluroid group.

The Mollusca of India have been illustrated by an excellent monograph of the Indian Clausiliae by Mr. W. Blanford and Dr. Stoliczka. The land shells of Penang, and of Burma and Arrakan, have been well illustrated and described.

Dr. Dobson has continued his able and careful researches on the Bats of India and adjoining countries, describing several new and most important forms. I greatly wish we could hope to see from Dr. Dobson's accurate pen, a well illustrated monograph of Indian Bats. He must have already brought together nearly all the facts requisite for such a detailed catalogue, and the needful illustrations could readily be obtained in this country. I have no doubt that such a work would at once meet with all the support requisite to secure its success. There is a vast amount of information bearing on the Matural History of India already published, but published in such a seattered way, single papers here and there, in different journals and in different languages, that ordinary students, under the conditions of Indian life, have

no possible means of knowing what has has been done, or what is already well known. Hence the supreme value of such monographs, compiled by those who have made a special study of the different groups and brought their knowledge up to date. No question such monographs would very rapidly require additions and call for alterations. Indeed this is the very result which would be sought by their publication, the bringing in new facts and exciting wider attention to the investigation. But this would not detract from their value, as statements of knowledge-acquired up to a certain date, and as affording a safe and carefully determined point of departure, from which future enquirers might start on their voyage of discovery.

The contributions of our able Secretary, Dr. Stoliczka, are valuable as usual. Besides his molluscan papers to which I have just alluded, we have a remarkably interesting and valuable paper on the Mammals and Birds inhabiting Kutch,—an admirable type of what the study of local faunæ is capable of yielding. He has also given some valuable notes on new or little known Lizards, and on Indian Batrachia; these papers on Kutch reptiles and Sind reptiles are sufficiently illustrated, and together constitute a range of additions to our knowledge of the Natural History of the country of the highest value and greatest scientific importance.

Ornithology has added to its store in the papers by Mr. Brookes on the Birds of Cashmir, and his brief notes on the Eagles, and Swans, &c. Mr. Hume has given a short critical notice of some Burmese birds; Major Godwin-Austen a third list of birds found in the Kasia and Garo hills, while Mr. W. Blanford has described and beautifully illustrated the birds of Sikkim. He has also given in the Journal the last part of a very interesting and charming account of his trip to the borders of Thibet in the Sikkim country, devoted entirely to the geological portion of his enquiries.

But while this summary will give sufficient evidence that the study of Natural History has lost none of its absorbing interest, and that the Asiatic Society of Bengal has fully and nobly maintained its grand traditional position as the repository of most of the advances made in these enquiries in this country, we can also congratulate you, gentlemen, that activity has been shown in other directions also, and outside our ranks. There is at last a fair prospect of the 'Flora Indica,' commenced many years since by Drs. Hooker and Thomson, being carried out under Dr. Hooker's guidance, and we are delighted to welcome it as a great, and at the same time necessary, contribution to our means of progress. The 'Flora Sylvatica' of Beddome also progresses soundly: the 'Conchologica Indica' of Hanley and Theobald, a work which, with all its very serious shortcomings, will be of great utility and value—still finds support and appears with regularity, while during the year we have had to welcome a new candidate for this support in an Indian magazine devoted to Ornithology. We could have wished that the author had completed the

several works which he had already commenced, rather than started a new publication. But we heartily welcome at the same time the issue of 'Stray Feathers.' It promises to be a useful catalogue of the Editor's very noble collection of Indian Birds, and a means of rapid publication of novelties or corrections, always of much value with ornithologists.

During the year also a very admirably illustrated work on the deadly Snakes of India has been issued at the cost of Government. The beautiful plates which are given with Dr. Fayrer's treatise on the Thanatophidia must always command attention and recommend the work, while unfortunately they also add so very seriously to the cost of the book as entirely to preclude the chance of its ever getting into the hands of any but the wealthy. The work too does not pretend to be more than a practical statement of facts concerning these dangerous enemies to human existence in the country. It has no scientific novelties or discoveries to render it important as a work of reference in libraries, while as we have said it is locked up from the general public to whom it might be useful by the extreme cost. Could not all the information be given in a far more accessible form and at a very trifling cost?

Other matters of high interest have been brought before the public, though not immediately through the Society. One of the most important and probably fruitful discoveries of modern years in Physiology has appeared in the modest form of an appendix to the eighth report of the Sanitary Commissioner with the Government of India. This is the discovery by Dr. Lewis of a Hæmatozoon, inhabiting the human blood, and certainly accompanying, and in all probability causing, peculiar conditions of the secretions, frequently rapidly fatal and always exceedingly injurious to health. This is scarcely the place to discuss the details of such a discovery which, bringing into notice a diseased condition hitherto totally unknown, and in all probability opening the road to further discoveries regarding obscure diseases, especially affecting countries situated as we here are within the tropics, opens up an entirely new but most important enquiry.

The careful researches of Dr. Lewis associated with his able colleague Dr. Cunningham into the history and concomitant conditions of choleraic affections, must be well known to most of our members. And I have no hesitation in saying that the last contribution of these gentlemen published in the same report I have alluded to, adds largely to the mass of facts, bearing on this, to India, all important subject. The accuracy with which every appearance is sifted, and the evidence investigated, before it be admitted as a fact, and the fulness of the information sought and obtained, will reader the entire series of these admirably conceived and executed microscopical enquiries, altogether essential to the study of this malignant.

disease, the cause of which is still so obscure and unknown. And I would add also, will form a very excellent contrast to the carelessly arranged and hastily admitted, or even distorted, evidence, which has more than once been adduced in support of some favourite hypothesis as to the mode of propagation of this disease.

Dr. Lewis has also given the results of a careful investigation of the condition of cysted meat, such as is frequently to be met within the bazar. And perhaps it may comfort many, who may have been alarmed by ideas of disease to be communicated by eating such food, to know that he has conclusively shewn that such living organisms are entirely killed, if the meat containing them, be subjected for even five minutes to a temperature of no less than 145° Faht. Rarely indeed are human beings found so cannibal in their tastes, that their cooked food has not been subjected to this condition of temperature, and therefore rarely indeed can there be any fears of such diseased condition of the tissues being conveyed into our system. It is also a gratifying result of Dr. Lewis's enquiry, to notice the very rare occurrence of diseased meat of this kind, among the rations provided for our troops in this country.

Though special in their application I cannot avoid bringing to your notice the extremely valuable series of volumes, prepared by my friend and colleague in the Geological Survey, Dr. Stoliczka, descriptive of the cretaceous fossils of South India. These volumes form an invaluable record descriptive of one of the finest and most extensive collections from a single formation and a single district, which has ever been brought together, and have been prepared with a fulness of illustration and a widely embracing accuracy of description which render them essential to the Palæontologist, and almost equally essential to the recent Conchologist. We desire to acknowledge the liberality with which the Government of the country has provided the funds necessary to enable us to double the quantity issued in the year of this series descriptive of Indian Fossils, and we rejoice the more in this, because we read it as a convincing testimony that the loving labours of my colleague, Stoliczka, are really appreciated. I who can speak from experience of his unfailing energy, of his untiring research and marked accuracy, and of his wide range of knowledge of all the bearings of his subject, know full well the immense labour which these works represent, the high scientific value of that labour, and the great interest which they have excited among the Paleontologists of Europe. But more than all this I know too, and appreciate fully, the unswerving loyalty to his task, which the author has invariably shewn, and the undeviating conscientiousness and devotion which he has brought to bear on its accomplishment. Not only do we feel the high claims that Dr. Stoliczka has to rank among the very first of living moliuscan Palmontologists, but personally I would testify also to the claims

which he has established to be viewed as one of our very best friends and advisers, as well our ablest colleague. We have been making great efforts to complete the entire series of these cretaceous fossils which will form four very large volumes, convinced that they will be the very best proof of the ability of the author that can be submitted to the world of science at Viefina, as well as the noblest monument of his zeal and power.

As speaking of the labour of the Geological survey I may here notice that we have been rewarded during the past year by one of the most important discoveries which stratigraphical palæontology has made for several Dr. Waagen, whom ill-health has, I am sorry to say, driven to Europe again, has found true Ammonites in beds which from their other fossil contents will be unhesitatingly admitted as palæozoic. There may be some slight question as to the exact horizon in the carboniferous series which these beds hold, or whether they may not to some extent represent the border land between the carboniferous and permian, but Athyris Roissyri, A. subtilita, Producta costata, &c. are species which will be at once admitted as carboniferous and these are the associates of the Ammonites. I had taken advantage of Dr. Waagen's wide knowledge of fossils and of their distribution in establishing a careful research into the stratigraphical relationships of the curiously distorted, and faulted rocks of the Salt-Range in the Panjab, from which some very interesting fossils had already been described by Koninck, Davidson, &c. and it was while so engaged that he was rewarded by this most important discovery. It would be passing into discussions rather too technical perhaps to enter here upon any consideration of how far this discovery is consistent with views based on the developmental theories now generally admitted in the explanation of the several homologies in such series as those acknowledged in the Cephalopoda. It will suffice to state that the fact of the occurrence of a true Ammonite in unquestionably palæozoic rocks is one calculated to excite as much surprise as did the announcement many years since of the beautiful Ammonites (with Orthoceratites) found in the Triassic beds of Europe. The curious fossil, with some other of its associates, has been figured in the Memoirs of the Geological Survey of India.

Viewed therefore as a whole, the year 1872 has not been unfruitful in natural history progress and a fair general activity in such pursuits has marked our Indian labours.

Among the questions of cosmical interest which have excited the attention of the scientific world lately, none is of higher or wider importance than the transit of the Planet Venus across the disc of the sun, which is to take place in 1874. For five years past, the attention of astronomers has been expressly directed to preparation for the observations required. And every Government and people, deserving to be called enlightened, has aided in these combined operations.

The last transit of Venus took place in 1769, more than a century since; and it needs but little consideration of the immense improvements which have been made in the accuracy of construction of astronomical instruments, in the preparation of telescopes, and above all in the marvellously beautiful application of photography in self-recording instruments for such transient phenomena, to see that there is not only a well founded hope, but a certainty, that the determination of the elements of the vast calculations to be based on the phenomena will be far more careful and more accurate than before. Fortunately also, another transit will recur within a short interval or in 1882, and with the experience gained in 1874 and the extension of points of observation contemplated for 1882, we may I think confidently look forward to seeing that all-important determination of the distance of the earth from the sun established with extreme accuracy. On this, as is well known, depend all the dimensions of the solar system. The British Government have undertaken the provision of instruments and observers for five stations. These are selected with a special view to their value, as enabling the best observations to be carried on. These five stations are, Oahu in the Sandwich Isles, Kerguelen Island in the Indian Ocean, Rodriguez a dependency of Mauritius, Auckland in New Zealand and Alexandria. Of the three first in the list, the longitude is to be determined accurately by a whole year's series of observations. Further, owing to the distance, the parties of observers must leave England more than six months before the time Instruments alone will cost considerably more than £10,000, of transit. conveyance, pay, sustenance as much more. This may seem a large sum, but as compared with the object in view, it is as nothing. The acquisition of knowledge of so much importance to all civilized nations, and the seizing on an opportunity of rare occurrence for fixing some of the most important astronomical and cosmical questions alone would have justified, nay would have demanded, the outlay of almost any sum. And I have no reason to doubt, that the answer to the suggestion to carry out this most important observation in a fitting manner from the head of the Treasury in Great Britain would have been precisely the same, 'they have no objection to offer to the expenditure, were the sum required ten times what it is.'

In addition to the stations thus specially selected, the observatories of Melbourne, and Sydney, of the Cape of Good Hope, Madras and Bombay, will all be utilized. The whole sea board of the United States of America, and the Canadian localities will all be favourably situated for certain observations and we may safely trust that the well known energy and zeal of our American brethren will not fail them here. To supplement the observations in the southern Hemisphere, by others in the northern, we must look to the Russians who have in their widely spread territories many localities admirably adapted for such observations. For one special class of observations

indeed, observations of the egress of the planet as retarded by parallax, these localities will be essential. But the well known skill of the Russian astronomers leads to the most implicit confidence that no portion of the required observations will be omitted in their hands. Such, gentlemen, are a few of the preparations which have been in progress for the observation of this rare phenomenon. And I am happy in now being able to announce to you that the Government of India have, on representations made to them of the value of a series of observations especially photographic in the clearer atmosphere of some high elevation in North India, at once sanctioned the necessary expenditure for instruments, and have telegraphed for their immediate preparation.

In connection with this, the General Committee of the British Association at their meeting in 1872, August last, requested the Council to take such steps as seemed desirable to urge the Indian Government to prepare these instruments, with the view of assisting in the Transit of Venus in 1874. And they added,—and to this I would ask your special attention—"and for the continuation of solar observations in India."

It may perhaps appear to some that we have quite enough experience of solar effects in this country without establishing an observatory for the special study of such facts. The intimate connection of what we speak of as the weather with changes on the solar surface, the remarkable statements lately put forth apparently with good ground, that the cyclones of the Indian Ocean and its more southerly extensions are also connected with these changes, and the bold assertion of a belief, by Mr. Maury, whose opportunities for observation have been unequalled, that he is fully convinced that changes in the seasons can be foretold with the aid of a properly conducted and sufficiently wide system of observations, all these facts tend to show the vast interests involved and the high importance which naturally attaches to such observations. And we cannot but express an ardent hope, that it may commend itself to the Government of this country to maintain and render permanent the small establishment about to be fixed on some elevated spot for the observation of the transit of Venus, and so form one observatory to be maintained for a special object and with a view to a continuous and sustained system of observations of those peculiar phenomena.

Col. Tennant, in submitting a brief statement of the advantages of such an observatory, has very justly insisted earnestly on the vast importance of determining beforehand the nature of the work to be done, and of carefully adhering to this system when once established. He pointedly refers to the glorious result of such a rigid adhesion to one object of work in the observatory of Greenwich, established with a special view to perfecting the art of navigation. Since the days of Charles the Second, the efforts of the astronomers of Greenwich have been without cessation devoted to building up what

Le Verrier has called that 'prodigious series of observations,' which may be taken as the fundamental bases of the theory of the moon. For now all but two hundred years have their efforts been devoted to increase and to preserve these glorious records. And the practically beneficent result to all civilized nations, and more especially to those much interested in navigation, have been almost incalculable.

I notice this point more prominently because I amthoroughly satisfied from experience now of many years in this country, that one of the great causes of the comparative failure of many well devised and for a time well carried out schemes of enquiry and observation has been this want of a maintenance of an established system fully thought out in the first instance and modified only so far as to improve and extend, without material alteration. This is unfortunately true of almost every department in this country. The agency is constantly changing and each successive occupant of a post thinks. it incumbent on him to signalize his reign by some change, all the better if marked and defined. Another may succeed, and a certain amount of reversion to old systems be again introduced. But meanwhile half the value of the accumulated knowledge is gone, because it is not as it were referable to the same standard. This curious absence of any want of faith in the traditional systems of operation which is to a large extent due to the rapid changes in the controlling elements in this country, and to the absence of those permanent officers, which in England are the mainspring of the machinery, and maintain the works in steady operation, men who in the great offices at home are in reality those who keep the Government of the country going, forms a remarkable contrast to the perfection with which the mere paper records of former Governments are kept, records which however are with exceeding rarity, if ever, examined by new incumbents, until some difficult question be raised.

But if a well designed system be once established with reference to such solar observations, and such studies of the motions of the satellites as Col. Tennant proposes, there can be very little doubt, that most valuable results will arise from a sustained systematic observation, which could never be expected from desultory action and interrupted system.

And looking to the immense gain which would result from such an observatory being at considerable elevation, above the mist and clouds which encumber the lower strata of the atmosphere in these countries there can be but little doubt that those results will be clearer and less obscure than could be the case at any lower elevation.

It is hoped that the establishment of such an observatory might be made the means of instruction to many in practical astronomy, means at present entirely wanting in this country. That the people of this land can investigate such subjects with much success is well shown by the care and

accuracy with which eclipses are calculated, while the visitor to Delhi or Benares will not have failed to be struck and deeply struck with the noble remains of the observatories of old, and will have dwelt with grief on the decay of knowledge since the days when such wondrous erections were not considered too costly or extensive for astronomical observations. Indeed it would seem that the maintenance of such observatories is one of those things which commend themselves to the wealthier natives of this land. And if trained observers, accustomed to work with the improved instruments of modern days, were available, I think we would be justified in anticipating that in many places such would be utilized; and their results, guided into proper channels by advice and system, would prove most valuable adjuncts to any general system of investigation. It is certain, that the establishment of such an observatory does hold out hopes of a successful teaching of astronomy which have long been sought, but have never existed in this country.

Another noble undertaking on the part of the British Government, in which Indian naturalists and geographers are deeply interested, is the expedition of H. M. S. 'Challenger' for a three or four years' cruise, with a view to the investigation, by dredgings and other means, of the physical history of the bottom of the sea, its currents, its temperature, its depth. Looking to the wonderful results obtained by a similar expedition under the guidance of the veteran Agassiz round the south coast of America we are justified in anticipating for the well organized and fully equipped expedition of the Challenger results of the very highest importance to Natural History, to geology, and to physics. And we doubt not that these hopes will be fully verified. But we in India, are especially interested in this expedition, inasmuch as we are, as it appears to me, bound to make every effort to supplement the researches of the Challenger, by similar investigations within our own waters. The Indian seas are not included, indeed have been excluded from the route adopted for the Challenger, and unless Indian naturalists can obtain the required information in other ways, there is no hope of obtaining it at all. A Committee of our Society has been organized for the purpose, as you are already aware; the necessary funds for the purchase of instruments have been granted, and these instruments are in progress; and it now only wants that a ship suited for the purpose may be placed at the disposal of the Committee, so that the work may be carried out. The ground to be examined is almost a virgin soil. There have not, that I am aware of, ever been any dredgings worth notice round our shores; and even the recent littoral conchology of the Indian seas' is very slightly known. An immense area of country is now formed of rocks of comparatively very recent formation round the coast of India, and it is simply impossible that the study of their rich molluscan fauna can ever be carried out effectively until the recent and living molluses of the existing ocean are better known.

It may probably interest some who have not followed out the preparation for these researches to mention briefly what has been done. 'Challenger' is a steam ship of nearly 1,500 tons burden. Her warlike armaments are removed as she is going essentially on a mission of peace. She carries no less than 600 gallons of alcohol, and 120,000 fathoms of line for soundings, with an ample supply of tubes and cups and vessels, all specially designed for bringing up the sand, mud, shells, &c. from the bottom of the ocean. A whole armoury of thermometers and other instruments, dredges, harpoons, cages for animals, Wardian cases for plants, &c., &c., accompany. In addition to the officers who have all been selected for their special acquirements and who will carry on a complete series of magnetic observations, there is Dr. Thomson who is at the head of the scientific part of the expedition; Mr. Moseley and Dr. Von Seeben as naturalists; Mr. Buchanan as chemist; Mr. Wild, as artist, and a skilled photographer from the Royal Engineers. The route is to be to Gibraltar and Madeira, thence across the Atlantic to Bermuda, east again to the Azores and Canaries; west to Brazil, Trinidad, and then to the Cape of Good Hope. Thence she will proceed to Kerguelen Island, then to the Antartic ice regions, to Australia, New Zealand: then she will visit the Coral Islands, New Guinea, Torres Straits, Manilla and Japan. From Japan to Vancouver's Island and thence to Valparaiso, the Magellan Straits, Rio Janeiro, and England, where she is expected to arrive in 1876.

Surely if such an undertaking can be accomplished in England, the great Government of India can carry out the comparatively petty labours which would be the lot of naturalists working up and down in Indian wat. rs.

Great pressure of other work, and I regret to say impaired health, have prevented my doing more than give you a very brief notice of some of the labours which have engaged the attention of the scientific world in India during the past year. I must ask your indulgence for its many short-comings, and now conclude by thanking you very heartily for the kindly and ready support I have during the year invariably received from the members of the Society, and by wishing that the coming season may find the Society more prosperous and more successful. Experience of the past leaves no doubt as to the activity of its supporters in their various lines of research. We have only to trust that the needful funds may be available to enable their researches to be brought properly before the public.

. The Meeting then resolved itself into an ordinary Monthly Meeting.

T. Oldham, Esq., LL. D., President, in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced.

From the author, a copy of a Report on the Bladder Worms found in Beef and Pork, by T. R. Lewis, M. B.

On a Hæmatozoon inhabiting Human Blood, by T. R. Lewis, M. B.

A Report of Microscopical and Physiological researches into the nature of the Agents producing Cholera, by T. R. Lewis, M. B. and D. D. Cunningham, M. B.

- 2. From the Chief Signal Officer. Washington, U.S., Three weather charts.
- 3. From the author, a copy of a work entitled Sherpur Bivarana or an account of the Sherpur Pargana, District Mymensing, in Bengali, Part I. Descriptive Geography, by Harachandra Chaudhuri.
- 4. From the Royal Society of Tasmania, copy of results of 5 years Meteorological Observations for Hobart Town and of Practical Hints to Emigrants intending to proceed to Tasmania with a full description of the several countries and their products, and a paper on local industries by E. C. Nowell, Esq.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected ordinary members.

R. R. Bayne, Esq.

T. R. Lewis, Esq., M. B.

The following are candidates for ballot at the next meeting.

A. Cappel, Esq., proposed by T. Oldham, Esq., LL. D., seconded by L. Schwendler, Esq.

A. J. Hughes, Esq., C. E., proposed by J. Wood-Mason, Esq., seconded by G. Nevill, Esq.

• G. W. Barclay, Esq., proposed by H. Blochmann, Esq., M. A., seconded by W. L. Heeley, Esq., C. S.

Babu Satyadayal Banerji, B. L., zemindar, proposed by Babu Rájendralála Mitra, seconded by H. Blochmann, Esq., M. A.

The following gentlemen have intimated their desire to withdraw from the Society.

J. H. Newman, Esq., M. D.

J. C. Geddes, Esq., C. S., Puri.

The election of Col. H. Drummond, R. E., is cancelled at his own request.

Letters were read-

1. From the Assistant Secretary to the Government of Bengal, forward-

ing copies of the following correspondence on the earthquake felt at Kámrúp on the 19th December last.

No. 2688T, dated Sibságar, the 30th December, 1872.

From—COLONEL H. HOPKINSON, Governor-General's Agent, North-East Frontier, and Commissioner of Assam.

To—The Officiating Secretary to the Government of Bengal, General Department.

I have the honor to submit, for the information of Government, an extract from Major Lamb's diary of the 19th December, 1872, regarding an earthquake which occurred in the Kámráp district on that date. I have not heard of the earthquake from any other district, but it appears to have been felt here (Sibságar) slightly, though I myself did not notice it.

Extract from the diary of Major Lamb, Deputy Commissioner, Kámrúp.

Thursday, 19th December .- "On my way back to camp, just as I was emerging from the sal forest,* I heard a sound, which at first I took to be caused by the beating of a large number of dholes or tom-toms, in a village about a mile or more in front of me, a little to the west of north, but after listening for a couple of seconds the sound was evidently progressing rapidly southward, and towards the direction of my camp, which was a mile to the west of where I was at the time, and gradually changed into what one might imagine a strong current of electricity would produce in passing through the earth from pole to pole southwards, shaking and rattling rocks and dispersing fragments in its progress just below the surface of the ground, the huge boulders being hurled down some rocky incline and shaking the very foundations of the earth at each rebound, until at last the sounds became more indistinct and resembled the sound of heavily laden waggons, going with considerable rapidity over a rough hewn rocky road; and passed off like distant thunder. There was no more possibility of mistaking the direction the sound came from and went in, than there would have been if I had heard only guns fired in two distant places, for each report was distinct, and as the sound passed along, it disturbed first some people in the direction of the village I alluded to, and they set up a shout, next a flock of paddy birds was scared and rose en masse, and still further south and west a herd of cows grazing, suddenly ran together and faced the jungle to the north for a few seconds, and then all turned round and commenced a regular stampede till brought up by a bheel. My turn came next, I was in my howdah and had a pad elephant with me, on which sat a forest ranger who went to show me the teak plantation and reserve. The animals put up their trunks and stood still for a few moments, but hearing the subterranean sounds approaching, both turned and evinced an unmistakable desire to

^{*} In mousah Pantan.

seek refuge in the forest which was within a hundred yards of us. The mahout on my elephant, by pressing the point of a bit of bamboo he had to drive the animal with against its forehead, persuaded him to believe that there was more to fear from the front than the rear, and so the animal stood grumbling till the tremulous motion of the earth subsided and the rumbling ceased. I saw the pad elephant just disappearing into the forest with his riders, and sent men after them to pick the unfortunates up, if they chanced to have been thrown off, and waited some time, but as they did not appear, I continued my course back to camp, and had the satisfaction of seeing the runaway bringing his riders along at full speed in the same direction when I was near my tent. Being on an elephant, I did not feel the motion of the ground nor did I perceive the trees move or the earth undulate, but the villagers I spoke to, seemed to think it was more severe the further I proceeded; and I noticed fissures in the moist sand of the river all in the same direction (east and west) athwart the course of the earthquake. I was met by a number of natives on my arrival, and they informed me that it was here almost as severe an earthquake as that which occurred in 1869, and that the first smart shock had been followed by two slight ones at short intervals. I must have been just within the left or southern margin of the course the current passed along. To-morrow I hope to be able to ascertain how far northward the shock was felt."

2. From the Secretary to the Government of India, Home Department, (Public) forwarding a set of 24 photographs taken by Major R. Gill, of the temples in the Buldana and Bassein districts in west Berar.

The following extracts from Major Gill's notes accompanying the photographs are of interest.

Extracts from notes on Hemadpauti Temples &c., made during a tour through a portion of West Berar in 1868, 1869 and in May, 1871 by Major GILL.

Jaipúr Kotli'.

At Jaipur Kotli, 14 miles north of Buldána, are two old temples; the finest is in the centre of the village, and the smaller one outside at a short distance to the south-east. The general plan of the larger temple is in the form of a cross, with the larger arm to the west, and the entrance to the east. The portiço which formed the east end, however, has now almost entirely fallen away. The south wing contains two small recesses, the outer one open at the top; the corresponding one in the north wing is only an enclosed recess containing a linga and yoni. The centre of the temple is fifteen feet two inches by fifteen feet one inch. In the centre of this the floor is allegably raised, forming a sort of square dais, at the corners of which are four columns eight feet eight inches in height, of the same style as those at

Vide photographs 26 and 27. the entrance, and supporting an architrave of one foot three inches deep, over which is a frieze one foot in height. This is ornamented with geometrical patterns on both faces, and with rosettes in the centres of the under sides. From the frieze rises the usual Hemadpauti dome ornamented with chaste shell pattern sculptures.

This temple is quite in the Jaina style of architecture of the early-part of the 13th century.

AMDAPIT'R.

Amdapur is 20 miles east of Buldana, and about half a mile to the south of the village is a small hill bordered on the south and south-east by a deep picturesque ravine, and falling out into the plain by gentle undulations to the north and west. On the summit of this hill stands a fine modern temple dedicated to Bhowani, of whom there is an image bedaubed with red lead in the sanctuary which is curiously lit from above in such a way as to throw the full light upon the image, while the spectator sees it only through a chink in the door, and, the mandar being nearly dark, the effect may be somewhat startling to the ignorant.

Near this temple are seen some fragments of a large colossal statue.

Vulc photograph 31. These are a pair of feet six and a half feet from toe to heel, and a hand to match, so that the statue may have been from fifty to sixty feet high. This enormous figure has not been a monolith, but built up in pieces, as is evident from the heel being separate from the fore part of the foot which includes the ankles. Over the foot there is an anklet but there is no indication of the toe-joints or of the extensor muscles over them, while the ankles are on a level with one another. Near them is another pair of feet somewhat smaller. The villagers say that a fine Hemadpauti temple formerly stood on the site of the present Hindu one; and this seems to be confirmed by the fragments built with it, and lying about in all directions.

SIRPU'R.

Sirpur is 56 miles east of Buldana, and a short distance to the west of it is the temple: It is entered by porticos on the north, south, and east sides. The doors are five feet four inches high, and two feet nine inches wide, and the porticoes are ten feet wide by nine feet six inches deep: These have been supported by two pillars in front and two pilasters, one on each side the door, corresponding with those inside. In the north portice a third

Vide photograph 35. pillar has been subsequently introduced to support the cross beam in front which had given way. In the centre of the temple are four columns nine and half feet and two feet three inches square at the base, forming a square ten feet nine inches on each side, in the middle of which is a low circular daïs seven feet eleven inches in diameter. In

Videphotographs 33,34 and 35, line with these pillars are pilesters on each. wall, and in the corners are half pilasters,

MARKAR.

Vide photographs 1st Series, 6, 7, 8, and 9: 2nd Series, 37 and 38.

Mahkar is nearly 28 miles west of Sirpúr. The temple is on the low spur of a hill, projecting from the lower or west side of the town, and nearly almost to the level of the Pen Ganga River; it con-

sists of a square court 21 feet 10 inches on each side, descended to by two steps on each face, and is surrounded by a triple colonnade, consisting of 60 pillars in all, with 32 pilasters against the outer wall, one opposite to each row of columns. The entrance is by a small door in the east face. Including the colonnades the length is 73 feet 4 inches, and the breadth 72 feet

91 inches. The columns in their general Vide photograph No. 38. style resemble those in most of the oldest temples all over British India, and are almost copies of those that still remain of the very oldest of the Jaina temples in Guzerat. The base and lower third or two-fifths of the shaft is square; on each side there rises from the plinth to the level of the upper side of the base a triangular facet, and this ornament is repeated in front of the double cincture and fillets that terminate the square portion of the shaft. The next member is a deep octangular band carved with leaves above which the pillar may be regarded as circular, rusticated by a square block and a thin octangular fillet carved with geometrical patterns. Above the block the shaft is cut into scotias and torusas interrupted by triangular facets on four sides. The capitals are thin with a narrow square fascine over a circular fillet and cyma recta, separated from the shaft by a torus. The capital is surmounted by a sur-capital of the quadruple-bracket sort so common in the Jaina temples at Girnár and elsewhere. The style and construction of the roof also is identical with the oldest Guzerat temples, and was doubtless connected historically with the style of the same western buildings through the Chalukya dynasty of Devagiri, now Dowlatabad. The columns are nearly equidistant, varying from six feet five inches to seven feet one inch; they do not exceed eight feet in height, and are so arranged that every four form a square of nearly one, and from capital to capital large slabs of stones are laid to support the roof. From centre to centre of these others are placed covering in the corners, and leaving a small square in the centre, the corners of which are again enclosed as before, leaving a still smaller square which is shut in by one large slab usually ornamented by a rosette in centre. Over this three or four feet of débris complete the roof.

In this building no cement of any kind has been used, as indeted lime was never employed by the Hindus before the Mahomedan invasion; the stones are cut so as exactly to fit one upon another.

LONA'R.

At Lonar, nearly 12 miles south of Mahkur, there are several Hengadtemples and tanks, also a Hindu temple which has evidently been

originally a Hemadpauti, if no Budhist's structure. Below this temple is a tank with flights of steps and terraces Vide photograph 24, 1st Series. leading down to it. The water flows through the sculptured kind* of a bullock, and is fabled to come under ground all the way from the Ganges. People of all castes, men, women and children bathe promiscuously in it. The water is constantly removed as it passes through one aperture at the bottom as fast as it flows in. Below the Hindu temple is the salt lake leading down to which Vide photograph 25, 1st Series. there has been a magnificent flight of steps, a large portion of which still remains.

Regarding this salt lake there is a wonderful legend of a giant named Lonâsur who lived in a subterraneous abode, made by himself under a hill about a mile from the place where the village of Lonar now stands. When this monster had destroyed many human beings and animals, and threatened to overthrow even the gods, the latter became alarmed and supplicated Vishnu to relieve them from the danger. Vishnu assumed the form of a beautiful youth to gain over the assistance of the giant's two sisters. their assistance he discovered the subterraneous dwelling, and with a touch of his toe he threw off the covering of the den and found the giant asleep. Engaging in single combat with him Vishnu slew him, and buried him in the very pit he had made his home: this was the present salt lake of Lonar. Its water is supposed to be his blood, and the salt is his decomposed flesh. A hill standing, according to the Berar Guzetteer, 36 miles to the south-west of Lonar, but according to my informant only about a koss from it, is said to be the lid of the den thrown off by Vishnu, and is reported to coincide in shape and size with the surface of the lake.

The lake is about a mile across, or three miles round, and is supVide photograph No. 24, 1st Series. posed to be the crater of an ancient volcano. Round the top of the basin is about five miles, and the sides
slope abruptly down, and are covered with jungle and trees. Immediately round the lake are dense rings of tamarind, date, and babul trees,
in which panthers, bears, and wild hog are frequently found, and in which
pea-fowl generally abound. Nearly in the centre of the lake are two deep
fissures hitherto unfathomed, through which impregnation takes place
during the monsoon, when only pure crystals of salt (Dalla) are obtained from
their edges by divers. But to enter these openings during the hot season
would be certain death. Evaporation takes place to a very considerable
extent during the hot season, and leaves a crystallized deposit (Papri) upon the
furface that gives the lake the appearance of being frozen over. This deposit
is carefully collected, as well as the earth (Bhuski) beneath it, which is also to
a certain extent impregnated. These deposits are very valuable, and yield a

handsome revenue to Government. Dalla is sold at Rupees 85 per kandi; papri at Rupees 18 to Rupees 25; and bhuski Rupees 8 to 10. present is Rupees 6,500 per annum on a three years' lease.

The finest temple is outside the village to the south within a mudwall. When I first visited it, more than twenty years ago, the whole basement was buried in debris, but the sculptures were far more perfect than they are The basement has been unearthed, and the temple otherwise thrown open, and now the first sight of it takes one by surprise.

Vide photographs 1st Series, Nos. 13, 14, 15, and 16.

Like those of Amruth and Somnath the whole exterior of this temple is one mass of sculpture, and the eaves and some of the borders are very beautiful; but though the quantity of sculpture is so great,

the subjects are comparatively few,—gods of the Hindu pantheon, obscenity in its grossest forms, dancing girls and musicians, and all the paraphernalia of debauchery. Many of the groups visible twenty years ago have since been knocked off, a piece of Vandalism similar to that acted at Ellora where several statues were emasculated to save the blushes forsooth of two prudish ladies: but still traces remain to render it a case of "honi soit qui mal v pense."

The next Hemadpauti temple is to the north of the village, and midway

Vide photographs 1st Series, Nos. 19 and 20.

between it and the temple and tank; it consists of a portico with small wings at each end open in front, but enclosed on the other

side and supported by three lines of columns and pilasters opposite each column in the third rank. It measures 102 feet by 20 feet, and there has been an enclosed building in a line with one of the wings. It is supposed to have been a place of almsgiving; the recipients occupy the portico while the victuals were cooked in the enclosure.

To the east of the large temple is a fine Hemadpauti tank.

Half way along the road to the salt lake is another very pretty temple, and there are four others in the margin of Vide photographs 1st Series, the lake, the three best of which are pic-

tured in the photographs.

Nos. 21, 22, and 28.

All these temples probably belong to about the 12th century when the Hindus seem to have been perfectly "mad upon their idols" and were only saved from utter degradation resulting therefrom by the inroads of the iconoclastic followers of Islam.

DHOTRA'.

Dhotrá is about 30 miles north by west from Lonár, and about half a mile south-east of the village stands a very fine temple, and near it are the remains of a splendid tank, which if cleared out would yield a plentiful supply of good water throughout the year to the poor villagers who have to ge

Vide photographs, Nos. 43, 44, and 45.

nearly a mile to secure only a scanty supply of water. The mere ruin of a second lies to the west, and a third, much smaller but perfect to the north-west, on the outskirts of the village.

SA'TGA'M.

Vide photographs Nos 2.3 & 4. 1st Series; and 43, 49, 2nd Series.

Vide photograph No. 46.

At Sátgám, 24 miles west of Dhotrá, there are five Hemadpauti temples. The principal one is just outside the west wall of the village, and almost adjoining it. On the north side are the remains of a small but beautiful temple which appears to have been originally in the same enclo-

The other three are closely within the village walls; the largest of them is merely an oblong apartment containing the Linga and Yoni and an image of Ganesh. There has been a verandah Vule photograph, No. 47. in front supported by four columns; and the entrance has been elaborately sculptured. In the centre of this verandah is a large sculpture of Nandi. The next in size consists of four columns supporting the architraves, above which is the common simple roof. But the backs of the posterior pair of columns being only rough hewn, this may have only been the portico of another temple.

The fifth is only a small cell distinguishable as Hemadpauti only by the pilasters on each side of the entrance.

Notes.

These temples are supposed by the natives to have been raised by demons in a single night, but from the title they generally bear they are ascribed to Hemad Kant or Hemadi Paut, who was prime minister to Ram Chandra Deva or Ram Deva Yado, the last of the Devagiri rajahs, of whom

Journal, Asiatic Royal Society, Vol. V., pages 178 and 188.

two copper-plate grants, dated respectively A. D. 1273 and A. D. 1291, have been published by Mr. Watham. He was also minis-

ter in the reign of Madhao, the predecessor of Ram Deva and in possession of all the regal powers. Mr. Walter Elliot dates the ascensions of Madhao in A. D. 1261, of Ram Chandra in A. D. 1272, and of Shunkur Deva in A. D. 1311.

All these temples, as already remarked, are erected without any coment of any kind. The different pieces are fitted together with the greatest accuracy and partially secured by tenons and mortices left on and cut into the blocks. They have been built with distinct inner and outer facings much like modern Public Works Department works, only the stones were not splayed back; and so the work was more likely to be durable. The interior of the wall was then filled up with cubbish,—the perfection of the hads of · the stones is evidenced by the length of time they have stood.

.The style of lighting is wonderfully adapted to the character of the works and architectural features, all lights being raking strike only the edges of the endless angles, and the result is a subdued brilliancy which is exceedingly pleasing.

The natives say that beneath the lingas in these are buried heaps of

treasures.

The receipt of the following communications was announced.

- Note on two coins from Kausambhi by the Hon'ble E. C. Bayley
 S. I.
- History of Pegu by Major General Sir A. P. Phayre, C. B., K. C.,
 I.

LIBRARY.

The following additions have been made to the Library since the last meeting.

Presentations.

* Names of Donors in Capitals.

Memoirs, Part II, Vol. XXXIX,

A. Sawitsch.—Les variations de la Pesanteur dans les Provinces Occidentales de l'Empire Russe. Prof. Cayley.—On the Geodesic Lines on an Ellipsoid,—The second part of a Memoir on the Development of the Disturbing Function in the Lunar and Planetary Theories J. W. L. Glaisher.—On the Law of Facility of Errors of Observations, and on the Method of Least Squares.

THE ROTAL ASTRONOMICAL SOCIETY.

Monatsbericht, August, 1872.

Braun.—Nachträgliche Mittheilungen über die Gattungen Marsilia und Pilularia Peters.—Über eine Sammlung von Batrachiern aus Neu-Freiburg in Brasilien.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Bulletin, Octobre, 1872.

E. Masqueray.—Le Gulf Stream.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Schriften, 1869-72, Jahrgang 10-13, Abtheilung 1te.

Prof. E. G. Zaddach.—Boobachtungen über des Vorkommen des Bernsteins und die Ausdehnung des Tertiargebirges in Westpreussen und Pommern. J. Schumann.—Preussische Diatomeen. Dr. A. Hensche.—Der Gräberfund bei Fürstenwalde. Dr. G. Berendt.—Ein geologischer Ausfing in die Russischen Nachbar-Gouvernements, Rob. Caspary.—Anhang, Pinus Abies, L. Arnold Ohlert.—Zusammenstellung der Lichnenen der Provinz Preussen. O. G. A. Brischke.—Die Rymenopteren der Provinz Preussen. A. Müller.—Ueber drei in der Provinz Preussen ausgegrabene Bärenschädel. Paul Schiefferdecker.—Der Begräbnissplatz bei Stangenwalde. Dr. H. E. Elinggräf.—Beschreibung der in Preussen gefundenen Arten und Varietäten der Gettung Sphaguum. Ernst Dorn.—Die Statten zur Messung von Erdtemperaturen zu Ednigsberg.

THE ROYAL PHYSICO-ECONOMICAL SOCIETY OF KÖNIGSBERG.

La Langue et la Littérature Hindoustanies, en 1872: Rhétorique et Prosodie des Langues de L'Orient Musulman, par M. Garcin de Tassy.

THE AUTHOR.

A Report on the Bladderworms found in Beef and Pork, by T. R. Lewis, M. B.:—A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera, by T. R. Lewis, M. B. and D. D. Cunningham, M. B.;—On a Hæmatozoon inhabiting Human Blood: its relation to Chyluria and other diseases, by T. R. Lewis, M. B.

THE AUTHORS.

Sherepur Bivarana, part I, Geography, by Harachandra Chaudhuri.

THE AUTHOR.

The Rajahs of Rajshahye, by Kissory Chand Mittra.

THE AUTHOR.

Results of Five Years' Meteorological Observations for Hobart Town, by F. Abbott; Practical Hints to Emigrants to Tasmania.

THE ROYAL SOCIETY OF TASMANIA.

War Department Weather Charts.

THE CHIEF SIGNAL OFFICER OF WASHINGTON, U. S. The Christian Spectator, Vol. 11, Nos. 19, 20.

THE EDITOR.

Ramáyana, Vol. III, part 4. Edited by Hemchandra.

THE-EDITOR.

Memoirs of the Geological Survey of India, Palxontologia Indica, Vol. IV. 2.

Dr F. Stoliczka.—Cretaceous Ciliopoda of Southern India.

THE SUPT. OF THE GEOLOGICAL SURVEY OF INDIA. Report on the Administration of Bengal, 1871-72.

THE GOVERNMENT OF BENGAL,

Exchange.

The Athenœum, Oct. and Nov., 1872.

Nature, Nos. 166—168.

Purchase.

Revue des Deux Mondes, 15 Nov., 1 Dec., 15 Dec., 1872. Comptes Rendus, No. 19, 1872.

M. Th. du Moncel.—Note sur les Courants accidentels qui naissent au sein des lignes télégraphiques dont un bout reste isolé dans l'air. M. Grace-Calvert,—Sur le pouvoir que possédent plusieurs substances d'arrêter la putréfaction et le développement de la vie protoplasmique. M. A Doran.—Sur les propriétés fébrifuges et antipériodiques des feuilles du Laurier d'Apollon. M. E. Ferrière.—Sur les causes de fiévres intermittentes et les moyens de les combattre. M. Piest.—Sur les propriétés antifermentescibles du silicate de soude. M. Carbonnier.—Sur la reproduction et le développement du poisson télescope, originaire de la Chine.

No. 20, 1872.

M. Besquerel.—Mémoire sur l'origine solaire de l'électricité atmosphérique. M. Dafeste.—E'tudes sur les types ostéolgiques des Poissons osseux.

No. 21, 1872.

M. Tresca.—Note sur la forme qu'il convient de donner aux mètres que la Commission internationale doit construire. M. Bouillaud. Sur la théorie de la production de la chaleur animale. M. Jeannel.—Rechorchos sur la production naturale des azotates et des azotates. Application de l'engrais minoral à l'horticulture. M. E. Bertin.—E'tude sur la fentilation d'un transport écurie. M. Léon Vaillant.—Sur la distribution Géographique des Percina. M. F. Tisserand.—Sur la planète (116) Sirona. M. J. Bouryet.—Théorie mathématique des expériences acoustiques de Kundt. M. Cazin.—Sur l'énergie magnétique. M. L. Cailletet.—Recherches sur l'acide carbonique liquide.

Nos. 22, 23, 1872.

M. Th. du Moncel.—Sur les courants accidentels qui naissent au sein des lignes télégraphiques dont un bout reste isolé dans l'air. M.M. A. Rabuteau et F. Papillon.—Des effets thérapeutiques du silicate de soude. M. L. Vaillant.—Sur la valeur de cortains caractères employés dans la classification des Poissons.

Journal des Savants, Novr. 1872.

M. J. Bertrand.—Théorie mathématique de l'électricité. M. Dulaurier.—Historiens anciens et modernes de l'Arménie.

Revue Archéologique, XI, 1872.

*M. V. Guerin.—Decouverte du Tombeau des Maocabées au Khirbet-el-Medieh jadis Modin.

Revue et Magasin de Zoologie, No. 10, 1872.

Dr. Jousseaume.—E'tude des genres Teinostoma, Cyclostroma et Skenea, (Several Indian species are described).

'The American Journal of Science, No. 22, 1872.

C. H. F. Peters. - Discovery of a new planet.

No. 23, 1872.

Joseph Leconte.—A Theory of the Formation of the great Features of the Earth's Surface. C. A. Young.—Catalogue of bright Lines in the Spectrum of the Solar Atmosphere. J. C. Draper.—Growth or Evolution of structure in seedlings.

The Ibis, October, 1872.

• A. V. Walden.—On a collection of birds recently made by Mr. A. H. Everett in North Borneo. O. Salvin.—Index to Ornithological Literature of 1871.

The Annals and Magazine of Natural History, Dec. 1872.

O. P. Cambridge.—On a new family and genus and two new species of Thelyphonidea, from Ceylon. Dr. A. Gunther.—On some new species of Reptiles and Fishes collected by J. Brenchley in Mongolia, Fejee Islands &c. Dr. A. Gunther.—On Psammoperca and Cnidon. C. Ritsema.—On Crinodes Sommeri and Tarsolepis Remicauda, in answer to Mr. Butler's remarks.

Conchologia Indica, Part 5.

APPENDIX.

LIST OF MEMBERS

OF THE

ASIATIC SOCIETY OF BENGAL,-

ON THE 31ST DECEMBER, 1872.

LIST OF ORDINARY MEMBERS.

The * distinguishes Non-Subscribing, the † Non-Resident Members, and the ‡ Life-Members.

N. B.—Gentlemen who may have changed their residence, since this list was drawn up, are requested to give intimation of such a change to the Secretaries, in order that the necessary alterations may be made in the subsequent edition. Errors or omissions in the following list should also be communicated to the Secretaries.

Gentlemen who are proceeding to Europe, with the intention of not returning to India, are particularly requested to notify to the Secretaries, whether it be their desire to continue as members of the Society, otherwise, in accordance with rule 14 B. of the Bye-laws, their names will be removed from the list at the expiration of three years from the time of their leaving India.

Date of Planton

Date of Election.		
1860 Dec. 5.	Abdullatif Khán Bahádur, Maulavi.	Calcutta
	†Adam, R. M., Esq.	Sambhar Lake,
-	•	viâ Jaipur
1869 Jan. 20.	*Adley, C. C., Esq., C. E., Nerbudda Coal &	-
	Iron Co.	Europe
1860 July 4	†Ahmad Khan, Sayyid, Bahádur.	Beneres
1872 April 3	†Ahsanullah Khwajah.	Dacca
1860 April 4	†Aitchison, J. E. T., Esq., M. D.	Ludiánah
1866 Jan. 17.	Allan, Lieut-Col. A. S.	Calcutta
	*Allardyce, A., Esq.	Europe
1871 June 7	†Alexander, J. W., Esq.	Benares
1860 Oct. 8	Amir Alí Khán, Bahádur, Munshi.	Calcutta
	Anderson, Dr. J., F. L. S.	Calcutta
	Anderson, A. Esq.	Futtehghur
	*Asghar Alí Khán Bahádur, Nawáh.	Europe
	Ashton, Rev. J. P.,	Calcutta
1871 Sept. 6	†Atkinson, E. T., Esq., C. S.	Allahabad
1855 July 4		Calcutta
1869 Feb. 3.	†Attar Singh Bahádur, Sirdár.	Loodiana
1870 Feb.	†Baden, Powell H., Esq., C. S.	Lahore
1859 Aug.	Baláichánd Sínha, Bábu.	Calcutta
1865 Nov.	†Ball, V., Esq., Geol. Survey.	Geol. S. Office
1860 Nov.	Banerjea, Rev. K. M.	Calcutta
1869 Dec.	†Barker, R. A., Esq., M. D.	Beerbhoom
1856 Sept.	Bashiruddin, Sultan, Muhammad.	Chinsurah
1869 Feb.	†Baxter, J. B., Esq., M. R. C. S.	Calcutta
1859 May	Bayley, E. C., The Hon'ble., B. C. S., C. S. I.	Calcutta
1961 Feb.	†Bayley, S. C., Esq., B. C. S.	Patna
1864 Sept.	†Beames, J., Esq., B. C. S.	Balasgre

Date of Election.	•	
1841 April 7.	Boarfort F. T. For B C S	Calcutta
		Mymensing .
1867 July 8.	†Belletty, N. A., Esq.	Bombor Mint
1869 Jan. 20.	†Bellew, Dr. P. F.	Bombay Mint
1871 March 1.	Benedict, E., Esq., C. E.	Calcutta
1862 Oct. 8.	Bernard, C. E., Esq., B. C. S.	Calcutta
		Calcutta •
1862 June	†Bhau Daji, Dr.	Bombay Chinamah
1864 Nov.	Bhudeva Mukerjea, Bábu.	Chingurah Coloretta
1872 Nov.	Bisset, Lieut. W. S. S., R. E.	Calcutta
1857 Mar.	Blanford, H. F., Esq., A. R. S. M., F. G. S.	Calcutta
1859 Aug.	†Blanford, W. T., Esq., A. R. S. M., F. G.	Funana
1004 Amril 0	S., Geol. Survey.	Europe
1004 April 0	Blochmann, H., Esq., M. A.	Calcutta Central Pro-
18/1 April 9	†Bourne, T. W., Esq.	
1070 T E	ADamma Tions T II	Vinces Shillow or
	†Bourne, Lieut. J. H.	Shillong
	†Bourne, Walter, Esq., C. E.	Madapoor
1000 Jan. 19.	Boxwell, J., Esq., C. S.	Serampore
	†Brandis, Dr. D.	Europe
	*Broadley, A. M., Esq.,	Europe
	†Brooks, W. E., Esq., C. E.	Assensole
	Brough, R. S., Esq.	Calcutta Moulmain
	†Brown, Col. D.	Moulmein Therestme
	†Browne, LieutCol. Horace A.	Thayetmo
	†Brownfield, C., Esq.	Kamrup
1000 Julie 0.	†Buck, E. C., Esq., C. S.	Cawnpu r Burdwan
	†Buckland, C. T., Esq., C. S.	_
	†Buckle, Dr. H. B., C. B.	Dacca
	†Buckle, H., Esq.	Akyab
1872 Jan. 3.	*Butcher, W. D., Esq., M. R. C. S.	Europe
1869 Jan. 20.	†Cadell, A., Esq., B. A., C. S.	Muzaffarnagar
1863 June 3.	Campbell, The Hon'ble G.	Calcutta
1860 Jan.	*Carnac, J. H. Rivett, Esq., B. C. S.	Europe
1868 Aug.	†Chandramohan, Gosvámi, Pandit.	Gowhati
1863 Aug.	†Chandranáth Ráy, Rája.	Nator
1871 Sept.	Chisholm, R. F., Esq.	Madras
1868 Feb.	†Clark, Major E. G., Bengal Staff Corps.	Kheree Oudh
	Clarke, C. B., Esq.	Dacca
	†Clutterbuck, Capt. F. St. Quintin.	Attock
	*Cole, Lieut. H. H., R. E.	Europe
	Colles, J. A. P., Esq., M. D.	Calcutta
1871 Oct. 4	†Cooke H. G., Esq., C. S.	Chittagong
1868 Dec. 2.	Cooke, J. E., Esq.	Haidarabad
1870 June 1.	Couch, The Hon'ble Sir R.	Calcutta
	*Court, Major M. H.	Europe
	Cowell, E. B., Esq., M. A.	Europe
1871 April 5.	Curtoys, W. J., Esq.	Calcutta
A		

Date of Election.	·	
1847 June 2.	†Dalton, Col. E. T., C. S. I., Staff Corps.	Chota Nagpur
1870 May 4.	†Damant, G. H., Esq., C. S.	Dinajepore
1861 March 6.	Davey, N. T. E., Revenue Survey.	Howrah
1861 Nov. 6.		Lahore
1869 April 7.	†Day, Dr. F., F. L. S., F. Z. S.	India
1856 June 4.	DeBourbel, Major R., Royal Engrs.	Oudh
1870 Feb. 2.	DeFabeck, F. W. A., Esq., B. M. Service.	Jaipur
1872 Aug., 7.	Dejoux, P., Esq.	Calcutta
1869 Oct. 6.		Delhi
1864 July 6.	Devendra Mallik, Babu.	Calcutta
1862 May 7.	†Dhanapati Singh Dughar, Ráy Bahádur.	Azimganj
1853 Sept. 7.	Dickens, Col. C. H., C. S. I.	Calcutta
1871 March 1.	Dijendranath Thakur, Babu.	Calcutta
1870 May 4.		Calcutta
1859 Sept. 7.		Meerut
1869 Feb. 3.	*Drew, F., Esq.	Europe
1870 March 8.	Duke of Edinburgh, His Royal Highness.	Europe
1867 June 5.		Europe
1007 5 une 0.	Duthor, W., Esq., C. S.	миоро
1868 Oct. 7	†Eddowes, W., Esq., M. D.	Erinpur
	Edgar, J. W., Esq., B. C. S.	Calcutta
	*Egerton, Ph., Esq., B. C. S.	Europe
1846 Jan. 7.		Europe
1859 Nov. 2.		Allahabad
1871 Oct. 4.		Poona
1863 Oct. 7.		Calcutta
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1851 May 7.	*Fayrer, Dr. J., C. S. I.	Europe
	†Fedden, Francis, Esq., Geol. Survey.	Geol. S. Office
1868 May 6.	†Field, C. D., Esq., M. A., C. S.	Chittagong
1869 Sept. 1.	†Fisher, J. H., Esq., C. S.	Raipore
1872 Dec. 4.		Lucknow
	†Ford, Lieut-Col. B.	Madras
	†Forest, R., Esq., Civil Engineer.	Dehra
1869 Oct. 12.	†Forlong, LieutCol. J. G. R., M. S. C.	Lucknow
1863 June 8.		Oudh
1871 Nov. 1.	†Foeter, J. M., Esq., M. R. C. P.	Europe ·
1869 Sept. 1.	†Fryer, Capt. G. E., Dy. Commissioner.	Sandoway
1859 Dec. 7.		Calcutta"
1867 Sept. 4.	†Fyfe, The Rev. W. C.	Europe
1849 Sept. 5.	45 1 15 1 4 1 4 4 4 5	Europe
1871 June 7.	Gangaprasad Sinha, Babu.	Calcutta
1871 Aug. 2.	†Gangaprasad, Munshi.	Moradabad
	Gastrell, Col, J. E., Supdt., Rev. Survey.	
1859 Aug. 8.	Gauradás Basák, Bábu.	Calcutta
1862 Feb. 5.		Calcutta
1867 Sept. 4. 1867 Dec. 4.	†Gauvain, Capt. V. Gay, E., Esq., M. A.	Calcutta c
1967 Dec. 4.	and, m., mad., m. w.	Calcutta c
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Date of Elec	tion.]
1050 8-4	. 7.	Combanhan T Ton D C C
1859 Sept 1869 Feb.		Geogheghan, J., Esq., B. C. S. †Giripraséd Singh, Thákur.
1861 Feb.		
TOOT Len.	Ο.	
1869 Oct.	6.	phical Survey. †Gomes, A. D. B., Esq.
1872 Nov	_	+Gordon C B D Fag
10/2 1104	. 6.	†Gordon, C. B. P., Esq.
1862 July	2.	†Gordon, J. D., Esq., C. S. I., C. S.
1869 July		
1871 Mar		
1871 Mar		
1863 Nov.		
1869 Oct.		*Gray, R., Esq., M. B.
1867 June		
1866 June		Gribble, T. W., Esq., B. C. S.
1861 Sept		†Griffin, L. H., Esq., B. C. S.
1860 Nov		
1861 Feb.		
1871 Jan.		
1864 Dec.		
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1871 June	7.	Habíburrahmán, Maulavi.
1867 July		l <u>-</u>
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1866 Jan.	17.	
1855 Mar		
1871 July		
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1861 Feb.	6.	
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1859 Oct.	12.	†Haughton, Col. J. C., C. S. I.
1862 Aug.	6.	
1872 May		Heilgers W. Esg.
1853 July		l . 9. // = •
1868 Aug.		
1872 Nov.		
1872 Dec.	4.	
1868 Nov.		
1863 Jan.		
1871 April		
1866 Feb.		Hoyle, G. W., Esq.
1867 Aug.		Hughes, T. H., Esq., A. R. S. M., F. G. S.
		Geol. Survey of India.
1866 Jan.	17.	Hughes, Captain W. G., M. S. C.
1870 Jan.	5.	Hume, Allan O., Esq., C. B., C. S.
1870 June	- 1	Hunter, W. W., Esq., LL. D., C. S.

Calcutta Allighur

East-Assam Sunderbuns Berhampore, Ganjam Mysore Henzaday Benares Dacca Allahabad Europe Europe Calcutta Lahore Benares Muttra Calcutta Backergunge

Calcutta Geol. S. Office. Ranchee Europe Wurdah Calcutta Mymensing Calcutta Azemgarh Muir's College, Allahabad Kooch Behar Calcutta Calcutta Europe Etah Manbhum Benares Europe · Europe Europe Calcutta

Geol. S. Office Arracan, Calcutta Calcutta

Date of Election.		1
1868 April, 1.	Hyde, LieutCol. H., R. E.	Calcutta
1869 Sept. 1.	*Hyde, E., Esq.	Europe
2000 topu. 2.		Lawopo
1872 Dec. 4.	*Ibbetson, D. C. J. Esq., C. S.	Europe
1870 April 6.	*Innes, F. W., Esq., M. D., C. B.	Europe
1866 March 7.	*Irvine, W., Esq., C. S.	Europe
1862 Oct. 8.	†Irwin, Valentine, Esq., C. S.	Cuttack
1871 March 1.	Isaac, T. S. Esq., C. E.	Calcutta
1853 Dec. 7.	†Isvariprasád Singh Bahádur, Rája.	Benares
1865 June 7.	†Jaykissen Dás Bahádur, Rájá, C. S. I.	Allighur
1866 Feb. 7.	†Johnson, W. H., Esq.	Sialkote
1862 March 5.	†Johnstone, Major J. W. H., Dy. Commis-	
1007 D- 4	sioner.	Bunnoo, Panjab
1867 Dec. 4.	†Johnstone, Capt. J.	Europe
1869 April 7.	Kabiruddin Ahmad, Maulavi	Calcutta
1871 May 3.		Calcutta
1861 Dec. 4.	Kempson, M., Esq., M. A.	Bareilly
1867 Dec. 4.	*King, G., Esq., M. B.	Europe
1867 March 6.	†King, Capt. H. W.	P. &O. Co's Office
1862 Jan. 15.	tKing, W., Jr., Esq., Geol. Survey of India.	Geol. Surv. O.
1867 March 6.	†Knox, G. E., Esq., C. S.	Allahabad
1860 May 5.	Kurz, S., Esq.	Calcutta
1869 Sept. 1.	*Latham, G., Esq., C. E.	Europe
1852 April 7.	*Lees, LieutCol. W. N., LL. D.	Europe
1868 Feb. 5.	*Lees, L. H., Esq., M. D.	Europe
1859 Dec. 7.	Leonard, H., Esq., M. A.	Calcutta
1870 July 6.	Leonard, H., Esq., M. A. Lethbridge, E., Esq., M. A.	Calcutta
1869 June 2.	*Leupolt, J. C., Esq., C. S.	Europe
1865 June 7.	†Lewin, Capt. T. H.	Chittagong
1864 NOV. 2.	Locke, H. H., Esq. "	Calcutta
1869 April 7.	†Lockwood, E. D., Esq., C. S. †Low, J. Esq., G. T. S.	Monghyr
1866 Jan. 17.	Low, J. Esq., G. T. S.	Almora
1869 July 7.	†Lyall, C. J., Esq., B. A., C. S.	Allahabad
1870 April 6.	Lyman, B. Smith, Esq.	America
1868 Dec. 2.	*Macauliff, M., Esq., B. A., C. S.	Europe
	Macdonald, Major J., Staff Corps.	Calcutta
	Maclagan, Col. R., R.E., F.R.S.E., F.R.G.S.	Lahore
	Macnamara, Dr. C.	Calcutta
	Macnaghten, C., Esq.	Rajkote College,
		Kattywar
1867 April 3.	Mahendralál Sircár, Dr.	Calcutta
1807 April 8.		Darjeeling
1862 Sept. 8.		Geol. S. Office
		Calcutta

Date of Elect	lon	·	
		135 73 77	D DI .
	. 6.	†Man, E. H., Esq.	Port Blair
1869 July	. 7.	†Markham, A. M., Esq., C. S.	Nynee Tal
1860 Marc	:b 7.	Medlicott, H. B., Esq., F. G. S., Geol.	~ . ~ ~ ~
	_	Survey of India.	Geol. S. Office
1871 Sept.		†Miles, Capt. S. B.	Bombay
1870 July			Calcutta
1867 June	5,		
		Bishop of Calcutta.	-Calcutta
1867 Marc	h 6,	†Montgomerie, Major T. G., R. E.	Dera Doon
1854 Dec.	6.	†Morris, G. G., Esq., B. C. S.	Backergunj
1854 Oct.	11.	†Muir, Śir W., K. C. S. I., B. C. S.	Allahabad
1862 July	2.	†Napier of Magdala, Lord R., General,	
-		G. C. S. I., G. C. B.	India
1871 Oct.	4.	* Neil, Dr. A.	Europe
1869 May			Calcutta
1865 Feb.			Lucknow
1870 Feb.		†Newman, J. H., Esq., M. D.	Ajmere
1871 Jan.			Europe
1872 May		†Niranjan Mukerji, Babu.	Benares
1869 July	7.	†Nursing Rao, A. V., Esq.	Vizagapatam
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1871 July	5.	†Oates, E. W., Esq., C. E.	Thayetmyo
1851 June			Calcutta
1867 Aug.		*Oldham, R. A., Esq., C. E.	Europe
1864 Mar.	2.	· Palmer, Dr. W. J.	Calcutta
1862 May	7.		Europe .
1871 Dec.	6.	†Peal, S. E., Esq.	Sibsagar, Assam
1867 Mar.			Uttarparah
1860 Feb.	1		Europe
1868 Nov.			Rawal Pindi
1869 July		Pell, S., Esq.	Calcutta
1864 Mar.		Pellew, F. H., Esq., C. S.	Hooghly •
1865 Sept.			Ranchi
1868 May	6.	Peterson, F. W., Esq.	Calcutta •
1835 July	1.	ADharma Major C. Sin A. D. K. C. S. I. C. R.	
1864 Nov.	2.	Phear, The Hon'ble J. B.	Calcutta
1869 Feb.	3.		Madras
1868 April		Pramathanáth Ráy, Kumár.	Digapati
1872 Dec.	1	Prananath Pandit, Babu.	Bhawanipore
1869 Feb.	8.	Pratápachandra Ghosha, B. A.	Calcutta
1871 T une		†Pratt, Capt. C. S., Staff-Corps.	Morar-Gwalior
1862 Oct.	8.	†Pulinavihúri Sen, Babú.	Berhampore
1856 Mar.	5.	Rájondralála Mitra, Bábú	Calcutta
1868 Jan.			Ranchi
1671 June	- 1	Rámakrishna Dás, Bábú.	Calcutta '
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Date of Election.
             I.
                 Ramánáth Thákur, The Hon'ble Raja.
                                                            Calcutta
1837 Feb.
                                                            Europe
1866 Jan.
           17. *Rattray, A., Esq.
               †Reid, H. S., Esq., C. S.
                                                            Allahabad
1860 Mar.
1871 July
               †Reid, J. R., Esq., C. S.
                                                            Azimghur
                                                            Balasore
1872 April
            8. Richard, Dr. V.
               Robb, G., Esq.
                                                            Calcutta
1868 April
            1.
               †Robertson, C., Esq., C. S.
                                                            Mirzapur
1863 April
            1.
            1.
                Robinson, S. H., Esq.
                                                            Calcutta
1865 Feb.
                                                            Calcutta
1870 Dec.
                Rogers, A., Esq.
                                                           Europe
1871 May
               *Rogers, Capt. B.
               †Ross, Lieut. J. C., R. E.
                                                            Boolundshuhur
1869 July
            7.
               †Ross, Alexander G., Capt. Staff Corps.
                                                           Edwardesabad
            5.
1870 Jan.
                                                            Calcutta
                Rundall, Col. F. H.
1871 April
               †Samuells, Capt. W. L.
                                                           Hazareebaugh
1871 Dec.
1871 May
               Sanderson, C., Esq.
                                                           Calcutta
                                                           Madras
               †Sashagiri Sastri M. B. A.
1872 Feb.
                                                           Calcutta
1870 May
            4.
                Satvánand Ghoshál, Rája.
1864 June
            1.
               *Saunders, J. O'B., Esq.
                                                           Europe
               †Saxton, Col. G. H., F. G. S., M. S. Corps.
                                                           Ootacamund
1854 Dec.
                                                           Calcutta
1870 May
            4.
               +Schlich, Dr. W.
                                                           Calcutta
1869 Feb.
            8.
               Schwendler, L., Esq.
                                                           Waltair,
                                                                       near
1860 July
            4. †Shelverton, G., Esq.
                                                             Vizagapatam
                                                           Umballa
1863 April
            1. †Showers. Lieut.-Col. C. L.
                                                           Delhi
1866 June
               †Sime, J., Esq., B. A.
               †Skrefsrud, Rev. L. O.
                                                           Rampur Haut
1872 Aug.
1864 Sept.
1866 June
            7. †Sladen, Major E. B.
                                                           Amherst
                                                           Raepur, C. P.
               †Smart, R. B., Esq., Rev. Survey.
            6.
                                                           Calcutta
1865 July
               Smith, D. Boyes, Esq., M. D.
                                                           Calcutta
                Smith, McLaren W., Esq.,
1868 April
            1.
                                                           Allahabad
1854 Sept.
            6. †Spankie, The Hon'ble B., B. C. S.
                                                           Prome
1864 Mar.
               †Spearman, Capt. H. R.
                                                           DeraGhazi Khan
1867 May
               †Steel, Capt. E. H., R. A.
               †Stephen, Carr, Esq.
                                                           Delhi
1872 July
               †Stewart, R. D., Esq.
                                                           Serajgunj
1863 Sept.
               †Stewart, J. L., Esq., M. D.
                                                           Panjab
1864 April
                                                           Calcutta
1870 April 6.
               Stewart, R., Esq.
               †St. John, R. T., Esq.
1870 Sept.
                                                           Akyab
                                                           Calcutta
1861 Sept.
                Stokes, Whitley, Esq.
               Stoliczka, F., Esq., Ph. D., F. G. S.,
                                                           Calcutta
1868 Nov.
               *Strachey, Major General, R., C. S. I., C.B.
                                                           Europe
1848 May
               *Strachey, The Hon'ble Sir J., K. C. S. I.
                                                           Europe
1869 Feb.
               †Stubbs, Major F. W., Royal Artillery.
                                                           Lucknow
1859 Mar.
               †Sutherland, H. C., Esq., B. C. S.
                                                           Sylhet
1958 July
                                                           Prome
1872 Dec. 4. †Swetenham, Capt. E.
1864 Abg. 11.
               Swinhoe, W., Esq.
                                                           Calcutta
                Syámácharan Sarcár, Bábú.
                                                           Calcutta
1965 Sept.
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Date of Election,				
1985	Sept.	· 6.	Tawney, C. H., Esq., M. A.	Calcutta
	April		1 ' - ' - '	Madras
1860		2.		
	Mar.	2.	†Theobald, W., Esq., Geological Survey.	B. Burma
1869		6.		Faizabad
	Mar.	- 1	*Thompson, Major G. H., Bengal Staff Corps.	Europe
1863	June	4.	*Thornton, T. H., Esq., D. C. L., C. S.	Europe
	June	2.	Thuillier, Col. H. L., Royal Artillery, F. R.	•
		•	S., C. S. I.	Calcutta
1865		5.	†Tolbort, T. W. H., Esq., C. S.	Bunnoo:
1865		5.	Tonnerre, Dr. C. F.	Calcutta
1871			Trefftz, Oscar, Esq.	Calcutta
	June		†Tremlett, J. D., Esq., M. A., C. S.	Moozuffergurh
1872		3.	Trevor, W. S., R. E.	Calcutta
1861		4.	Tween, A., Esq., Geological Survey.	Calcutta
1863	May	6.	*Tyler, Dr. J.	Europe
1869	June	2.	†Udayachánd Datt, Bábú.	Nowakhali
1868	Sont	2.	Van Cutsem, E. Ch. Esq.	Calcutta
1860		2.	†Vanrenen, Major A. D., Bengal Staff Corps.	
1864		3.		Benares
1864				
		- 1	Báhadur, Mahárájah Mirza.	Vizianagram
1870	Juno	1.	†Vrindávanachandra Mandala, Bábú.	Balasore-
1871	Feb.	1.	†Waagen, Dr. W.	Europe
1869	Aug.	4.	Wáhid Alí, Prince Jahán Qadr Muhammad,	a , " +t ,
			Bahádur.	Garden Reach
1865		1.	Waldie, D., Esq., F. G. S.	Calcutta
1861		1.	Walker, Col. J. T., R. E., F. R. S.	Dehra Doon
1863	_	7.	Waller, W. K., Esq., M. B.	Calcutta Furruckabad
1862		15.	†Ward, G. E., Esq., B. C. S.	Calcutta
1865		3.	Waterhouse, Capt. J., B. S. C. *Westland, J., Esq., C. S.	Europe
1869 (1867)		1. 6.	*Westmacott, E. V., Esq., B. A., C. S.	Europe
1862	_	8.	†Wheeler, J. T., Esq.	Burma
1867		7.	†Wilcox, F., Esq.	Purulia
1867		16.	†Williamson, Lieut. W. J.	Garo Hills
1867		6.	Willson, W. G., Esq., B. A.	Calcutta
1871		1.	†Willson, James, Esq., B. A.	Geol. Survey
1870	Aug.	8.	Wilson, R. H., Esq., C. S.	Calcutta
1866	Mar.	7.	†Wise, Dr. J. F. N.	Dacca
1867	July	8.	†Wood, Dr. J. J.,	Ranchi
1870		5.	Wood-Mason, J., Esq., F. G. S.	Calcutta
1851	May	7.	Woodrow, H., Esq., M. A.	Calcutta -
1869 8	Sept.	1.	Yadulál Mallik, Bábu.	Calcutta
		- 1		

Date of Election.

1868 Júne 8. Yatendra Mohun Tagore, Rajah Bahádúr. 1467 Mar. 6. Yogendranáth Mallik, Bábu.

Calcutta Andul

HONORARY MEMBERS.

Date of Election.		
1825 Mar. 9.	M. Garcin de Tassy, Memb. de l'Institut.	Paris
1821 ,, 6.		London
1826 July 1.		Paris
	Prof. C. Lassen.	Bonn
	Prof. Lea.	Philadelphia
1842 Feb. 4.		Göttingen
1842 " 4.	Right Hon'ble Sir Edward Ryan, Kt.	London
1843 Mar. 30.		Paris
1847 Sept. 1.		London
	His Highness the Nawab Nazim of Bengal.	Murshidabad
1848 Feb. 2.	Dr. J. D. Hooker, R. N., F. R. S.	Kew
1848 Mar. 8.	Prof. Henry.	Princeton, U. S.
	Major-Gen. Sir H. C. Rawlinson, K. C. B.	London
1858 July 6.	B. H. Hodgson, Esq.	Europe
1859 Mar. 2.	The Hon'ble Sir J. W. Colvile, Kt.	Europe
1860 Mar. 7.	Prof. Max Müller.	Strassburg
1860 Nov. 7.	Mons. Stanislas Julien.	Paris
1860 . 7.	Dr. Robert Wight.	London
1860 , 7.	Edward Thomas, Esq.	London .
1860 , 7.		Bern
1860 " 7.	Dr. Albrecht Weber.	Berlin
1865 Sept. 6.	Edward Blyth, Esq.	Europ e
1868 Feb. 5.		India
1868 " 5.		Benares
1868 " 5.		London .
8186 " 2.		London
1871 , 7.		Londo n
1872 , 1.		London ' "
1872 June 5.	Prof. T. Huxley.	London

CORRESPONDING MEMBERS.

 1844 Oct.
 2.
 Macgowan, Dr. J.
 Europe

 1856 June, 4.
 4.
 Kramer, Herr A. von, Alexandria
 Alexandria

 1856 , 4
 Porter, Rev. J.
 Damascus

Date of Election	n.)		•
1856 June	4.	Schlagintweit, Herr H. von.	Munich	
1856 "	4.		Beyrout	•
1859 "	4.	Tailor, J., Esq.	Bussorah	
1856 "	4.	Wilson, Dr.	Bombay	
1857 Mar.	4.	Neitner, J., Esq.	Ceylon	
1858 Mar.	3.	Schlagintweit, Herr R. von.	Giesen	
1859 Nov.	2.	Frederick, Dr. H.	Batavia	
1859 May	4.	Bleeker, Dr. H.	Europe	
1860 Feb.		Baker, The Rev. H.	E. Malabar	
1860 "	1.	Swinhoe, R., Esq., H. M.'s Consul.	Amoy	
1860 April	4.	Haug, Dr. M.	Punah	
1861 July	3.		Berlin	
1862 Mar.	5.	Murray, A., Esq.	London	
1863 July		Barnes, R. H., Esq.	Ceylon	
1866 May	7.	Schlagintweit, Prof. E. von.	Munich	
1866 "	7.		Benares	
1868 Feb.		Foucaux, M. F. H.	Paris	
1868 "	5.	Hölmboe, Prof.	Christiania	
•	- 1			

ASSOCIATE MEMBERS.

1835 Oct.	7.	Stephenson, J., Esq.	Europe
1838 Feb.	7.	Karámat Alí, Sayyid.	Hooghl y
1843 Dec.	6.	Long, Rev. J.	Europe
1865 May	3.	Dall, Rev. C. H.	Calcutta

LIST OF MEMBERS WHO HAVE BEEN ABSENT FROM INDIA THREE YEARS AND UPWARDS.*

Rule 14, A.—In the event of an Ordinary Member leaving India, and in the further event of his informing the Secretary by letter that he has no intention of returning, but desires to retain his privileges as an Ordinary Member, his subscription shall be 12 Rupees per annum, commutable into a single payment of Rs. 100, provided that if any such Member shall hereafter return to India, he shall thereupon become liable to pay his original subscriptions, subject to the operation of rule 10 B.

Rule 14, B.—After the lapse of three years from the date of a Member leaving India, if no intimation of his wishes shall, in the interval, have been received by the Society, his name shall be removed from the list of

Members.

,	Date of Landy a Talia
Abbet Meier Common T D A	Date of Leaving India.
Abbot, Major General J., R. A.	1868 1857
Allan, C., Esq., B. C. S.	
Alabaster, C., Esq.	1860
Anderson, W., Esq.	1868
Anderson, LieutCol. W. B.	1854
Asphar, J. J. T., Esq.	1862
Baker, Col. W. E., Bengal Engineers.	1857
Barry, Dr. J. B.	1864
Batten, J. H., Esq., B. C. S.	1866
Baynes, J., Esq.	1869
Beadon, The Hon'ble Sir Cecil., B. C. S.	1867
Beckwith, J., Esq.	1858
Benson, LieutCol. R.	1854
Birch, Major General Sir R. J. H., K. C. B.	1863
Blagrave, Major T. C., 26th Regiment, B. N. I.	1859
Blane, Col. Sir S. J.	1869
Boycott, Dr. T., B. M. S.	1860
Brandreth, The Hon'ble J. E. L.	1868
Broderick, H. C., Esq., M. D.	1868
Brodie, Capt. T., 5th Regiment, B. N. I.	1853
Campbell, Dr. A.	1862
Cleghorn, Dr. H.	1867
Colvin, J. H. B., Esq., B. C. S.	1853
Cox, W. H., Esq.,	1866
Crockett, Oliver R., Esq.	1861
CIOCEGOO, OHIGI IS., TOA.	1301
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[•] These names will be removed from the next list of members unless intimation to meanwhile received from any of the members of their desire to retain the privileges of ordinary members under the operation of Rule 14 A.

	1
	Date of Leaving India.
Dolumpia E A Fac	
Dalrymple, F. A., Esq.	1865
Devereux, The Hon'ble H. B., B. C. S.	1862
Dunlop, H. G., Esq.	1866
Earle, Capt. E. L., Bengal Artillery.	1864
Eatwell, Dr. W. C. B.	1861
Ellis, LieutCol. R. R. W.	1861
Edgeworth, M. P., Esq., B. C. S.	1862
Elphinstone, Capt. M. W., 30th Regiment, B. N. I.	
Erskine, The Hon'ble C. J., Bombay C. S.	1868
	1863
Erskine, Major W. C. B.	1859
Eyre, Col. Vincent C. B.	1863
Fitzwilliam, The Hon'ble W. S.	1863
Frederic Prince of Schleswig Holstein, H. R. H.	1869
Frere, Sir H. Bartle, K. C. B., B. C. S.	1867
	1000
Grant, The Hon'tle Sir J. P., K. C. B.	1862
Grant, T. R., Esq.	1862
Gladstone, W., Esq.	1856
Goodeve, E., Esq., M. D.	1865
Guthrie, Col. C. S.	1867
Hall, F. E., Esq., M. A., D. C. L.	1862
Hamilton, Col. G. W.	
	1867
Hannyngton, Col. J. C., 63rd Regiment, N. I.	1862
Hardie, Dr. G. K.	1861
Harington, The Hon'ble H. B.	1865 .
Henry, N. A., Esq.	1867
Hichens, Major W., Royal Engineers.	1857
Hyatt, Dr., B. N.	1868
Jackson, W. B., Esq., B. C. S.	1854
Johnstone, J., Esq.	1854
Jones, R., Esq.	1862
Kane, H. S., Esq.	1863
Kay, Rev. W.	1864
and a second sec	1502
Laing, The Hon'ble S.	1862
Lindsay, E. J., Esq.	1860
Liebig, Dr. G. von.	1859
Lovett, Major B., R. E.	1866
Lushington, F. A., Esq.	1861
	1000
Macrae, Dr. A. C.	1869
Maine, The Hon'ble Sir H. S.	1869
Mair, D. K., Esq.	1865 .

•	Date of Leaving India.
Marshman, J. C., Esq.	1856
McClelland, Dr. J.	1865
Middleton, J., Esq.	1857
Miles, A. J. M., Esq., B. C. S.	1856
Money, D. J., Esq., B. C. S.	1859
Muir, J., Esq.	1854
Nicholls, Capt. W. T., 29th Regiment, M. N. I.	1861
O'Shaughnessy, Sir W. R.	1857
Ouseley, Major W. R.	1858
Paul, J., Esq.	1869
Petit, Mons. Eugene,	1889
Place, Mons. V.	1868
Riddell, The Hon'ble H. B., B. C. S.	1867
Rogers, Capt. T. E.	· 185 7
Schiller, F., Esq.,	1869
Scott, Col. E. W. S.	1862
Sherwill, LieutCol. W. S., 66th Regiment, B. N. I.	1861
Smith, Col. J. F.	1857
Stephen, Major J. G., 8th N. I.	1859
Thompson, J. G., Esq.	1865
Thurlow, The Hon'ble T. J. H.	1863
Torrens, Col. H. D.	1866
Trevelyan, The Right Hon'ble Sir C., K. C. B.	1865
Trevor, The Hon'ble, C. B., B. C. S.	1867
Wall, P. W., Esq., C. E.	1864
Ward, J. J., Esq., C. S.	1861
Warrand, R. H. M., Esq., B. C. S.	1865
Watson, J., Esq., B. C. S.	1859
Waugh, Major General Sir A. S., C. B., F. R. S.	1861
Wilmot, E. W., Esq.	1869
Wortley, Major A. H. P.	1861
Young, LieutCol. C. B.	1862
Yule, Col. H., R. E.	1862
•	

LOSS OF MEMBERS DURING 1872.

BY RETIREMENT.

W. Oldham Esq., LL. D., C. S.	Europe
LieutCol. J. J. McLeod Innes.	Calcutta
LicutCol. D. J. F. Newall, R. A.	Gwalior
Dr. G. W. Leitner.	Lahore
J. A. Aldis, Esq.	Calcutta _
Khalifah Sayyid Muhammad Husain.	Patiala -
The Hon'ble W. Markby.	Calcutta
W. E. Ayrton, Esq.	Europe
J. A. Briggs, Esq.	Calcutta
J. Smith, Esq., C. S.	Ghazipu r
F. N. Macnamara, Esq., M. D.	Calcu tta
Major J. M. Graham.	Dhurrung
C. B. Saunders, Esq., C. B.	Hyderabad
M. L. Ferrar, Ésq., C. S.	Fyzabad
Dr. S. M. Shircore.	Calcutta
S. Lobb, Esq.	Krishnagur
Col. J. F. Tennant, R. E.	Calcutta

BY DEATH.

The Hon'ble Sir D. F. McLeod, C. B., K. C. S. I.	Europe
C. Horne, Esq., C. S.	Europe
W. Abbey, Esq.	Rangoon
Dr. T. C. Jerdon.	Europe
Capt. A. B. Melville.	Europe
J. W. Laidlay, Esq.	Europe
Rev. J. Roberts.	Europe
Sir W. Denison, K. C. B.	Europe
Dr. T. Goldstücker, Corresponding Member.	Europe
Col. W. H. Sykes, F. R. S., Honorary Member.	London

ELECTIONS CANCELLED.

Nawáb Ziauddín Ahmad Khán Bahádur.
Capt. A.,J. Filgate, R. E.

Delhi
Calcutta

APPENDIX.

ABSTRACT STATEMENT

OF

RECEIPTS AND DISBURSEMENTS

OF THE

ASIATIC SOCIETY OF BENGAL

FOR

THE YEAR 1872.

STATEMENT Abstract of the Cash Account

Annuageness Women										
Admission Fres.					18	372.		18	71.	
Received from Members,	Rs.	. 768	0	0					•	
Subscriptions.	•			_	768	0	0	1,472	0	•
			_							
Received from Members,	***	7,551	0	0	7,551	0	Λ	7,044	7	
Publications.					1,001	Ů	·	7,099	•	
Sale proceeds of Journal and Pr	roceedings.	399	7	9						
Subscriptions to ditto,		854		Ō						
Refund of Postage Stamps,		17	11	Õ						
Ditto of Freight,		3	-6	ŏ						
Ditto of packing charges,		ĩ	4	Õ						
LIBRARY.	-				1,276	8	9	1,729	8	- (
		0.50	_	_						
Sale proceeds of Books,		258	8	0						
Refund of Freight,		14	6	0						
Ditto of Postage Stamps,		4	4	0	055	^	_	021	_	
SECRETARY'S OFFICE.	. ~			_	277	2	0	371	3	
Received Commission on purch	age of Pos-									
tama Stamma	aso of 1 os-	11	3	0						
	•••	5	8	ŏ						
	•••	3	ő	-						
Received Fine,	•••		U	0	19	11	Λ	32	7	1,
VESTED. FUND.	-	-			10	11	v	84	7	10
Received Interest on the Gover	nment So.									
curities from the Bank of Be		110	0	0						
Less Income-Tax on ditto,		- i	2	ŏ						
sess income-raz on divio,	•••		۳.		108	14	٥	109	11	(
Miscellanfous.					200		٠	103		•
D. P. Fund,		83	2	2						
The Government North Wes	tern Pro-	•	-	-						
f minage 7		13	8	0						
Syded Walioollah,	***	534	2	ŏ						
Y T Danton	• • • • • • • • • • • • • • • • • • • •	0	ã	ŏ						
Babu Odaya Chanda Datta.	•••	ŏ	9	ŏ						
desars. Williams and Norgate,	***	ĭ	ő	ŏ						
L. Sashagiri Sastri,	•••	12	ŏ	ŏ						
	•••		10	ŏ						
The Baptist Mission Press,	•••		3	Ü						
f. S. Growse, Esq.	•••	4	_	-						
apt. G. E. Fryer,	***		12	.0						
Or. A. Neil,	•••	0	_	10	-					
Dr. F. Stoliczka,	•••	6	8	ŏ						
he Rev. F. Mason,	•••	3		Ŏ						
I. V. Westmacott, Esq	•••	84	19	0						
	_	718		- 0 -						

No. 1. of the Asiatic Society for 1872.

DISBURS	EMEN	TS						·	
Publications.				18	72.		18	71.	
Paid Freight for sending Journal and	_								
Proceedings to Messrs. Williams and									
Norgate Rs.	40	6	0						
Ditto Lithographing & Engraving charges,	1,371		_						
Ditto Printing charges,	4,741								
Ditto Commission on Sale of Books, &c.,	42		_						
Ditto Binding charges,	6 155	_							
Ditto Paper for Plates, &c., Ditto Purchase of Postage Stamps,	234		_						
Ditto Price of two Plates from London,		15	_						
Ditto Freight and sending charges for			•						
ditto,	16	8	3						
Ditto Petty charges,	13	11	6			_			
-				6,703	8	2	5,273	14	10
LIBRARY.									
Paid Salary of the Librarian,	990	0	0						
Ditto Establishment,	120	0	0						
Ditto Commission on Sale of Books,	27								
Ditto Landing charges,		14	_						
Ditto Book binding,	.9	_	-						
Ditto Subscription to the Medical Gazette,	15 17		-						
Ditto Salary of Punkhaman, Ditto Insufficient Postage,	1,		-						
Ditto Insumment Postage, Ditto Subscription to the Indian Anti-	-	•	٠						
quary,	20	_							
Ditto Subscription to the Calcutta Review,	16	_	_						
Ditto Purchase of Books,	93		_						
Petty charges,	19	13		1,344	4	Я	2,540	14	۵
				1,011	•	٠,	2,0,20	1.4	•
SECRETARY'S OFFICE.									
Paid General Establishment,	366	0	0						
Ditto Secretary's Office Establishment,	1,592	0	.0						
Ditto Purchase of Postage Stamps,	97	7							
Ditto Ditto Stationery,	. 51	3 12	6						
Ditto Insufficient Postage, Ditto Meeting charges,	140		6	•					
Ditto Commission on Collecting Subscrip-	240		•						
tions,	42	3	0						
Ditto Salary of Mali,	57	0	0						
Ditto Subscription to the Army List,	30								
Ditto Ditto Directory,	14						•		
Ditto Printing charges,	. 62	6	3						
Ditto a Sheet Almanac,	1	U	v						
	2,456	15	1.						
Carr				8,057	2	5			
					•				

RECEI	PTS.	187	1872.				
Brought over, Rs. E. T. Atkinson, Esq. Capt. W. J. Williamson, A. Anderson, Esq. Dr. F. Day, L. Schwendler, Esq. The Hon'ble E. C. Bayley, G. Nevill, Esq. J. Wood-Masou, Esq.	713 10 8 1 3 1 2 13 4 6 5 4 0 6 1 8 9 12	0 10,001 9 0 0 0 0 0 0 0 0 748 14	3 9				

	DISBUR	SEMEN	TS.		18	372.	1871.			
Brough	t over, R	. 2,456	15	1	8,047	12	5			
Ditto Advertising charges,		. 8		0						
Paid a Copy of Postal Guide, Ditto Fee to the Bank of I	Bengal fo	. 1	8	0						
Stamping Blank Cheques,	ongur ro	. 1	9	0						
Ditto repairing a Clock,	•		-	0						
Ditto Ditto Case for ditto, Ditto Petty charges,	••		$\frac{0}{12}$	0						
	•		~=	•	2,520	0	1	2,918	10	2
VESTED FUND.										
Paid Commission to the Bank	of Benga	ıl								
for drawing interest on the	e Govern		,							
ment Securities,	••	0	4	-4 	0	4	4	0	4	4
Building.					·	•	•			•
Paid House rate,	•	. 432	0	0						
Ditto Police and Lighting rate	,	. 198		ŏ						
Ditto Water rate,	••	. 211		0						
Ditto Repairing charges,	••	. 11	12	3	853	7	3	877	3	2
					000	•	ð	0//	0	٥
COIN FUND.	D									
Paid for Purchase of 29 Silver	Bactria	n . 110	0	0						
Ditto Insufficient Postage on a	parcel o	-	v	v						
Coins,	·	. 0	3	0						
Ditto Postage Stamps for re- packet of Coins to Englan	turning a	A.								
address of Mr. Foster,	u w	. 25	6	0						
Ditto Tinman for shutting	Tin Case		_							
for ditto,	••	0	2	0	135	11	0	0	0	•
W				_	100	11	U	U	U	U
MISCELLANEOUS.		. 531	7	6						
Syed Wallioollah, Dr. J. F. N. Wise,	••		12	ŏ						
J. Wood-Mason, Esq		0	9	Ŏ						
The Baptist Mission Press,	••		10	0						
Babu Pratapa Chandra Ghosha, Dr. F. Day,		Ä.	10 6	6						
E. T. Atkinson, Esq.,	•••	ē	11	9						
F. S. Growse, Esq.,	•••	1	8	0						
M. Sashagiri Sastri,	•••	12 34	15	0						
E. V. Westmacott, Esq., J. Beames, Esq.,	•••		12	ŏ						
E. C. Bayley, The Hon'ble,		0	6	0						
Col. J. C. Haughton,	•••		•7	0						
Capt. W. L. Samuells, Col. H. Hyde,	•••	2	2	ŏ						
A. M. Broadley, Esq.	•••	A.	0	Ō						
Capt. W. J. Williamson,	110	4	4	0						
		635	8	- 9.						
	Ca	rried ove			1,557	3	1			
			•				-			

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Rs. 13,203 5 10

(Sd.) BUDDINATH BYSACK,

Cashier,

Asiatic Society Bengal.

(Sd.) LOUIS SCHWENDLER, (Sd.) F. W. PETERSON,

Auditors.

	DIS	BURSE	MEN	TS.		18	72.		1871.
O. P. Fund,	ought ove	•••	635 59	8 5	91 0	1,557	3	1	
The Government North vinces, A. M. Markham, Esq. J. G. Delmerick, Esq. L. Schwendler, Esq.	Western	Pro-	13 1 1 5	0 4	0 0 0				
The Rev. F. Mason, A. V. Nursing Rao, W. Stokes, Esq. A. Anderson, Esq. V. Richards, Esq.	•••			12 4 2 15 11	0 0 0 6 0	734	10	0	
BALANCE. In the Bank of Bengal, Cash in hand,			767 143	9 5	4 2	911		6	
		(Sd.	.) Bt			3,203 H By	SACI	ζ,	
			Asi	atic	Soc	iety E		Cashi al.	er,
		(Sd.) (Sd.)				endli Rson, Au	ER, dito	rs.	•

STATEMENT

Abstract of the Cash Account

RECEIPTS.												
ORIENTAL PUBLICATIONS.					18	372.		187	1.			
Received by Sale of Bibliotheca Indica, R Ditto by Subscription to ditto, Ditto Refund of Postage and Packing charge	′		0	8 0 0	2,57 0) 1	. 8	2,581	1	0		
GOVERNMENT ALLOWANCE.												
Received from the General Treasury at 500 R per month, Ditto ditto additional grant for the publice tion of Sanskrit works, at 250 Rs. p	6, a- or	000		0								
month,	3,	000	0	0	0.000	٥	٥	0.000	^	^		
Col. E. Dalton, Ethnology of Bengal, Asiatic Society of Bengal, J. R. Reid, Esq P. Teromul Rao, Munshi Kapursing, Thakur Griprasad Singh, Dr. James Wise, Ram Kissen G. Bhauder Ker, Krishna Rao Hanmant, Babu Rutton Lal, Dr. G. Buhler, Kafipurapa Veneataratum, Babu Kader Nath Ghosal, Pandita Sheonarain, Baluba Deb Siug, Babu Broj Bhushun Doss, Jubanand Joshee,		2 <u>1</u> 2 6	0 0 12 0 4	-	416			9,000	0	0		
G												
e Conservation of Sanscrit MSS. Received from the Accountt. General of Bengal in part of the amount sauctioned toward the conservation of Sanscrit MSS. being the 2nd half of 1871-72, Ditto ditto the 1st half of 1872-73, Refaud of the amount paid Babu Rajendrs Lala Mitra, as advance for purchase o. Sanscrit MSS Sale proceeds of 13 Copies of Notices Sans crit MSS. Refaud by transfer to the O. P. Fund, being the amount paid to Premchand Chaudhry, his salary for the month of April last,	s 1,5 . 1,5	50 50 00 13		0 0 0	3 ,543	0	0 :	1,814	0 (•		

No. 2.
Oriental Publication Fund for 1872.

DISBURS	EM	ENTS	١.							
ORIENTAL PUBLICATIONS.					18	72.		187	71.	
Paid Commission on Sale of Books, Packing charges, Postage Stamps, Advertising charges, Freight,	Rs.	261 32 112 400 147	13 13 5 0	0 6 0 0						
Bearing Postage, Commission on collecting Bill, Petty charges,	,	0	2 3 15	3	959	4	0	1,190	14	8
Library.										
Paid Purchase of 150 copies of Sanscrit MS Ditto as advance of Subscription Hindu Cor mittee, Vol. V., Nos. 1 to 12,		313 10	14 0	0						
22, 11, 11, 11, 11, 11, 11, 11, 11, 11,	-		_Ľ	_	323	14	0	190	14	6
CUSTODY OF ORIENTAL WORKS. Paid Salary of the Librarian,		360	0	0						
Establishment,		574	Ŏ	ŏ						
Stationery,		72 3	9	0						
Fee for Stamping Cheques, Book binding,		14	4	9						
Petty charges,		14		ō						
	~			_	1,038	4	0	1,088	3	6
CATALOGUE OF SANSCRIT MSS.										
Paid Salary for Cataloguing Sanscrit MSS at 30 Rs. per month,	3.,	360	0	0	36 0	0	0	360	0	0
MAASIR ALAMGIRI. Paid Printing charges,		445	0	0						
	_		_	_	445	0	0	550	0	0
FARHANG I RASHIDI. Paid Editing and Printing,	1	,153	0	0	1,153	0	0	703	0	0
GOBILYA GRIHYA SUTRA. Paid Printing charges,		474	0	0	474	0	0	406		•
TANDYA MOHA BRAHWANA. Paid Editing and Printing charges,		656	6	0	656	6	Ī	1,812.	19	a
SAMA VEDA. Paid Editing and Printing charges,		656	6	0	656	6	0	984	•	•
TAITTIBLYA PRATISAKHYA. Paid Editing and Printing charges,		593	9	0	593	9	0,	828	3	0
MIMANSA DARSANA. Paid Printing charges,		109	11	0	109	11	0	589	`. 10	
-		a	. 10				_			-
Ca	rme	a 046	г, п	·5.	6,769	6	0			

xxvi

RECEIPTS. 1872. 1871.

Brought over, Rs. 15,530 1 2

xxvii

DISBURSEMENTS.							72 .		187	71.	
Taittiriya Sanhita of thi	ght over, E	ls.				6,769	6	0	•		
YAJUR VEDA. Paid Editing and Printing charge	ges,	•••	956	0	0			_			_
CHATURVARGA CHINTAMANI. Paid Editing and Printing charge	waa	-	1 919	19	_	956	0	0	889	12	0
9 9	300,	···-	1,312	12	_	1,312	12	0	656	6	0
ATHARVANA UPANISHAD. Paid Editing and Printing charge	ges,	•••_	332	9	0	332	a	0	•		
GOPATHA BRAHMANA. Paid Editing and Printing charge		•••	562		0	002		·			
Ditto Banghy expense for sonding	ng MSS.	···-	1	11	°	563	13	0	232	8	0
Pingula Chhanda Sutra. Paid Printing charges,	••		232	3	0	000		_			
AKBAR NAMAH. Paid Editing charges,		- 	96	 0	_ 0	232	3	0			
	••	-		_	_	96	0	0			
TABAQUAT f NASHI. Paid Messrs. Gilbert Rivington, don, for Printing charges by change, £50-10-6, on the Cash tal Bank, London, at 1-10‡,	a Bill of E tier of Orie	X-	533	0	0	533	0	0			
LATIYANA SRAUTA SUTRA. Banghy expenses for sending	2 Packets	of.			_	999	U	v			
3.5	2 I MOROUS	···_	2	4	0	2	4	0	232	8	0
TAITTIRIYA ARANYAKA. Paid Editing charges,	•••	•••	151	8	0		•	_			
AIN I AKBARI.		-			_	151	8	0	• 396	8	U
Paid for Purchase of Ain i Akban	ri, .	•••	45	8	0						
	••	•••	192	0	0						
Printing charges, Preparing a Geographical Index		98	703	0	0						
to the Ain i Akbari, .		•••	*80	0	0						
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POEMS OF CHAND.						2,022	•	٠	2,120	•	٠
Paid Printing charges, .		•••	30	0	0						
Freight and Packing charges Poems of Chand,		۱g.	4	10	6						
roems of Onand,	••	···-			_	84	10	б	8	15	θ
COPYING MSS.											
Paid copying charges, .			<u> </u>	9	0	57	9	0	198	E	٥
		•••	88 5	24	8	-	•	_		•	•
J. Woodburn, Esq	 	••	_	12	0						
Pandita Chandrakanta Tarkalan Bam Krishna G. Bhauderka		• •		0	ŏ					•	
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		-	000		_						
	C	ett	266 ied ove	_	8 la, 1	2,063	8	6	•		

XXVIII

REC	RECEIPTS							
Brought over,	Rs.			•	15,580	1	2	
BALANCE OF 1871.			•					
In the Bank of Bengal, viz., Account-Curr	ent.							
Dr. J. Muir,		898	10	0				
Ditto Conservation of Sanscrit MSS.,		2,849	0	11				
Ditto Col. Dalton, Ethnology of Bengal,	•••		12	0				
Ditto O. P. Fund,		1,786	5	7				
	•	7,984	19	-6				
Cash in hand			14	7				
Chen in nand,	•••				8,006	11	1	

Rs. 23,586 12 8

⁽Sd.) BUDDINATH BISACK,

Cashier. Asiatic Society of Bengal.

⁽Sd.) Louis Schwendler, (Sd.) F. W. Peterson, Auditors.

	DISBURSE	MENT	8.	18	72.	1	871.
Thakur Griprasad Singh, Balvadeb Sing,	Brought over, Rs.	100	13	8 12,0 0 0	063	8 6	
Pandit Sheonarian, Dr. James Wise, Kapursing Munshi,		97	6 8	9			
Col. E. T. Dalton, Ethnolog		2,520	5	0 2,9	909 1	2 5	
CONSERVATION OF SAN Paid Salary for preparing (
orit MSS., Ditto ditto for translating i		860	0	0			
logue, Ditto Printing charges of	•••	240	0	0			
MSS.,	•••	1,198		0			
Ditto Postage for sending No Ditto Freight for ditto ditto		, 3 70		6 0			
Ditto Copying MSS., Ditto Pasteboard, &c., for	·	24	8	0			
Sanscrit MSS.,		18	9 5	6 0			
Ditto for Stationery, Ditto Printing 2,000 Copies		65	0	0			
Ditto Purchase of Sanscrit Ditto Banghy Expenses fo			18 11	0			
Ditto Packing charges, Ditto by transfer to the C	P. Fund, being	22	6	Ò			
the Salary of Premchand the month of April last,	ra Chaudhury, ior	30	0	0			
Ditto Petty charges,	•••	2	0	6 2.4	15	8 6	
				17,8		8 5	
BALANCE,				,-		•	
In the Bank of Bengal. Dr. J. Muir,	•••	898	10	0			
Conservation of Sanscrit Man	SS.,	3,976 1,262		5 9			
•		6,137	11	2			
Cash in hand,		10	8	8 6,1	48	8 10	
			R	s. 23,5			•
	•	Sd.) E	tunn	INATH	Rysa	CK.	
	• (1	·			C	ashie	of Bengal.
				Z			of monday.

⁽Sd.) Louis Schwendler, (Sd.) F. W. Peterson, Auditors.

STATEMENT No. 3.

	1873.
	Showing the Assets and Liabilities of the Asiatic Society of Bengal on the 1st Iny. 1873.
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1872.	247 14 8									3,011 156	2,300	Bs 5,715	LOUIS SCHWENDLER
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LIABILITIES.	nent for December, PUBLICATIONS.	263 2	118	494	760	606	74	232	. 8	İ	2,000 300		
T	Salary and Establishment for December, 1872, (actual), PUBLICATIONS.	(actual),	dex (actu		(estimate	Part II Nos. 3 & 4	Plates Paper for the above,	Printing of ditto (actual,)	ωï	-0	Library. Williams and Norgate, 2,000 0 0 Messrs. Trubner and Co., 300 0 0 2,300 0 0		
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	767 9 4 143 15 2 2,000 0 0		00	90	796 2 9 390 7 0 112 8 0	•		•					6

STATEMENT No. 4. Shewing the Assets and Liabilities of the Asiatic Society of Bangal on the 1st Iny. 1873.

1871.																	,						
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1872.			1,493	496		316 7 charges.		121		8	3	86			•	464		8	112	888 10	8,976	8,854 14	Louis Schwendler. F. N. Peterson.
LIABILITIES. Salary and Establishment for December,	Mission Press printing che i Bashidi, Fasc. 253 ditto, Fasc. VIII. 243	Badshanamah, No. 251., 452 10 0 Taittiriya Aranyaka, Fasc. XI.,	13	Akbarnamah, Fasc I & II.	Valmiki Press printing charges. Sranta. Sutra of Latvane.	Fasc. IX., Sle 7	Sranta Sutra of Latyane,	Fasc. LX	Index and for examining	the proof sheets of Bad-	Shanaman, Varata Chandra Surma Editing charges.	Hemadri, Fasc. VII.,	Ganesa Press, Printing charges.	- 1	Atharvana Opanishad, Fasc. II., 232 3 0		Ramomoya Tarkaratna Editing charges. Atharyana Upaniahad, Fasc.		Asiatic Society of Bengal,		Conservation of Mans. Miss.	B	J. W.
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	6 0 9 6,137 10	750	1,825 15	7				•														Bs 8,767	
SSETS.																							
Asa	3,976 8 898 10 1,262 8																					A	
K Ben	of Sanscrit	Government allowance for December, 1872, Bibliotheca Sale and Sub-	Scription, Col Dalton's Ethnology of	Bengal,																			

STATEMENT No. 8. Conservation of Sanscrit MSS. in Account Current with the Asiatic Society of Bengal.

Dr.	2,415 8 6 3,976 8 5						Rs 6,392 0 11	LOUIS SCHWENDLER.
	Amount spent in 1872, Balance,							
•					0 11		0 11	
	,				6,392 0 11		Bs 6,392	
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	2,849 0 11	1,550	400	ĕ	7			
5	Balance of 1877, Beceived from the Government of Bengal, being the half sum sanctioned, annually Rs. 3,100, towards the conservation and unbinetics of Sanctions and unbinetics.	for the second half of 1871-73. Ditto ditto for the 1st half 1872-73. Safund of the amount paid Babu B. L.	Grit MSS. on the 9th October, 1871 Befind by transfer to the O. P. F. the	selfary for the month of April, last,	Sanacric MSS.,			

F. N. PETERSON.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of January 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrica? elements
dependent thereon.

	Mean Height of the Barometer at 320 Faht.		of the Ba		Mean Dry Bulb Thermometer.	Range ture o	of the Te luring the	mpera-
Date.	Mean H the Ba at 320	Max.	Min.	Diff.	Mean J Therm	Max.	Min.	Diff.
	Inches,	Inches.	Inches.	Inches.	0	0	o	0
1	29.923	30.000	29.860		65.8	75.2	58.5	16.7
2	.922	29,002	.878	.111	66.5	77.5	58.0	19.5
3	.876	.931	.899	125	66.6	78.0	57.5	20.5
4	.911	.973		.111	67.3	79.0	58.2	20.8
5	.907	.991	.835	.156	69.1	79.8	59.4	20.4
6	.853	.917	.801	.116	71.5	83.6	61.5	22.1
7	.848	.903	.805	.098	73.4	84.0	66.5	17.5
8	.932	30.005	.857	.148	72.6	81.0	68.5	12.5
9	.988	.071	.941	.130	63.3	71.4	57.5	13.9
10	.952	.037	.886	.151	62.2	71.5	54,8	16.7
11	.980	.053	.922	.131	61.5	69.5	54.7	14.8
12	.996	.069	.934	.135	61.2	71.5	53.0	18.5
13	.994	.068	.924	.141	62.1	72.5	53.5	19.0
14	.976 .923	.060	.920 .865	.140 .118	65.7	78.5	55.0	23.5
15 16	.930	29.983 30.012	.805	.118	68.4	80.3 78.0	62.8 59.5	17.5
17	.902	29.981	.818	.133	68.4	78.7	60.0	18.5
18	.964	30.039	.905	.134	69.8	80.0	62.0	18.7 18.0
19	.990	.064	.942	.122	71.5	78.0	67.7	10.3
20	30.030	.091	.975	.116	69.9	77.5	64.0*	13.5
21 -	.070	.160	30.018	.142	70.0	79.0	62.5	16.5
22	.075	.155	.010	.145	69.8	77.5	62.7	14.8
23	.066	.156	.002	.154	69.8	78.5	62.7	15.8
24	.033	.123	29.960	.163	70.1	78.5	63.2	16.8
25	29.950	.029	884	.145	70.7	80.6	61.9	18.7
26	.918	29.998	.868	.130	71.2	80.5	65.4	15.1 .
27	.935	30.019	.868	.151	68.7	78.6	60.6	18.0
28	.963	.046	.907	.139	66.1	77.3	55.8	21.5
20	.987	.060	.937	.123	67.5	79.0	58.7	20.8
80	30.002	.081	.940	.141	67.9	79.0	58.0	21.0
81	.017	.101	.971	.130	70.2	82.0	0.00	22.0
-	· 36		· · · · · · · · · ·					-

The Mean Height of the Barometer, as likewise the Dry and West Bulb.

Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations tuken at the Surveyor General's Office, Calcutta, in the month of January 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

			· pendene	· · · · · · · · · · · · · · · · · · ·	(0000000			
Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point,	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	MeanWeight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity. complete saturation being unity.
	o	•	o	0	Inches.	T. gr.	T. gr.	
12345678901112131456789012232456789011122012232456789011120123245678901222456789012224567890122245678901222456789012224567890122245678000000000000000000000000000000000000	60.7 60.9 60.9 60.9 66.1 68.5 68.8 65.4 61.8 61.7 66.1 61.7 66.5 67.8 65.0 64.6 64.3 64.4 65.0 65.5 64.4 65.0 65.5 64.4 65.0 65.5 68.1	5.16 5.7 7.4 5.4 9.8 7.7 6.0 9.5 6.7 8.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5.7 5	56.6 56.4 56.3 51.0 61.8 61.8 61.6 65.8 48.3 48.1 46.9 48.8 50.7 56.7 56.3 61.8 61.1 60.3 59.8 60.4 60.9 50.4 60.9 50.4 60.9 50.4 60.9 50.4 60.9 50.4 60.9 60.8 60.4 60.8	9.2 10.1 10.3 13.3 11.7 9.7 8.8 6.8 15.0 14.1 14.6 12.4 11.4 10.6 11.7 12.1 6.7 8.8 9.7 9.9 9.9 9.5 10.3 10.3 10.3 15.8 15.7 15.1 13.9	0.467 .464 .462 .428 .480 .555 .609 .634 .352 .350 .336 .358 .382 .444 .504 .469 .469 .469 .528 .521 .528 .521 .528 .520 .530 .530 .543 .543 .521 .528 .520 .530 .543 .543 .543 .543 .543 .543 .543 .543	5.18 .14 .13 4.73 5.28 6.09 .66 .94 3.93 .91 .75 4.01 .93 5.55 .16 .10 6.55 .73 5.97 .81 .71 .83 .92 4.55 .20 .48 .72 5.27	1.86 2.05 .08 .64 .50 .29 .21 1.72 2.58 .38 .41 .09 1.99 2.09 .33 .46 .52 1.40 .65 2.01 .14 .32 .95 .38 .31 4 2.90	0.74 .72 .74 .64 .68 .73 .75 .80 .60 .62 .61 .66 .68 .70 .70 .68 .67 .73 .71 .71 .71 .71 .71 .75 .76

the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	eight of meter at aht.	Range for e	of the Ba ach hour the month	during	ry Bulb meter.	Range of the Tempera ture for each hour during the month.				
Hour.	Mean Height of the Barometer at 32° Faht.	Max.	Min.	Diff.	Mean Dry Bul Thermometer.	Max.	Min.	Diff.		
	Inches.	Inches.	Inches.	Tuches.	o	o	•	0		
Mid-night. 1 2 3 4 5 6 7 8 9 10 11	29.967 .956 .916 .936 .932 .942 .955 .975 30.001 .027 .037	30.086 .077 .070 .056 .049 .062 .074 .091 .124 .150 .160	29.853 .836 .826 .817 .811 .815 .836 .858 .871 .895 .903 .890	0.233 .241 .241 .239 .238 .247 .238 .247 .236 .253 .265 .257 .263	61.2 63.5 62.8 62.1 61.5 61.1 60.5 62.0 65.0 69.5 72.3	70.8 70.5 70.0 69.6 69.2 69.0 68.7 68.5 69.7 70.5 73.5	57.0 56.0 55.5 54.5 54.0 53.0 53.0 55.0 59.5 • 62.7 65.0	13.8 14.5 14.5 15.1 15.2 16.0 15.7 15.5 14.7 11.0 10.8 12.4		
Noon. 1 2 3 4 5 6 7 8 9 10 11	29.995 .902 .933 .914 .907 .912 .923 .940 .960 .974 .982•	.125 .082 .050 .037 .029 .030 .041 .062 .072 .083 .098	.868 .840 .815 .808 .805 .801 .826 .841 .861 .874 .882	.257 .242 .235 .229 .224 .229 .215 .221 .211 .209 .216 .217	74.6 76.2 77.3 77.8 76.6 75.2 72.0 70.1 68.5 67.1 66.0 65.2	80.6 82.4 83.7 84.0 82.5 81.0 77.6 75.5 73.5 71.5 71.0	67.0 68.6 69.0 69.5 68.0 66.8 64.5 62.5 61.2 59.5 58.0	13.6 13.8 14.7 14.5 14.5 14.2 13.1 13.0 12.9 13.0		

The Mean Height of the Barometer, as likewise the Dramd Wet Ball.

Thermometer Means are derived from the observations made at the sarpent hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

Hour	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elactic force of Vapour.	Mean Weight of Vapour in a Cubic foot of arr.	Additional Weight of Vapour required for complete struction.	Mean degree of Humidity. complete saturation being unity.
	0	0	0	o	Inches.	T. gr.	T. gr.	
Mid-night. 1 2 8 4 5 6 7 8 9 10 11	60 8 60.3 59.8 59.3 58.8 58.4 5.80 5 77° 58.9 60.6 62.5 63.2	3 4 3.2 3 0 2.8 2.7 2.7 2.5 2.5 3.1 5.0 7.0 9.1	57.7 57.4 57.1 56.8 56.4 56.0 55.7 55.1 56.6 56.9 55.9	65 61 57 53 51 5.1 48 48 5.9 9.0 12.6 16.4	0.485 .480 .475 .470 .461 .458 .458 .459 .467 .472 .456	5 38 .35 .30 .26 .19 .13 .08 .03 .14 .18 .18	*1.31 .20 .11 .01 0.97 .95 .89 .88 1.11 .82 2.70 3.59	0.80 .83 .83 .84 .84 .85 .85 .82 .74 .66
Noen. 12 8 4 5 6 7 8 9 10 11	63.9 64.4 64.9 65.0 64.7 65.0 64.2 63.5 62.6 62.1 61.5	10.7 11.8 12.4 12.2 12.2 10.5 7.0 5.9 5.0 4.5 8.9 8.7	56.4 56.1 - 56.2 56.0 55.9 57.3 59.4 59.5 59.5 59.0 58.5	18.2 20.1 21.1 21.8 20.7 17.9 12.6 10.6 9.0 8.1 7.0 6.7	.464 .450 .461 .458 .456 .478 .513 .515 .506 .506 .498	5.05 4.99 .90 .95 .91 5.20 .61 .65 .68 .60 .61	4·15 .67 .99 5.18 4.83 .17 2.89 .38 1.97 .72 .47	.55 .52 .59 .49 .51 .66 .70 .74 .77 .79

Affice Hygrometrical elements are computed by the Greenwich Constants.

Meteorological Observations,

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta,

.#i.the month of January 1873.

Solar Radiation, Weather, &c.

	olar D.	age ove d.	Wind			•
Date.	Max. Solar radiation.	Rain Guage 1½ ft. above Ground.	Prevailing direction.	Max. Pressure	Daily Velocity.	General aspect of the Sky.
1	130.0	Inches	NNE&WNW	115	Miles 74.8	B. Slightly foggy at midnight
	122.6		WNW&NW	.]	50.5	& 1 A. M., & from 7 to 10 P. M.
		""			30.5	B. Slightly foggy from 5 to 9 A. M., & 7 to 10 P. M.
8	127.5		SSE&NW		49.7	B. Slightly foggy at 6 & 7 A. M. & from 7 to 10 P. M.
4	124.9		NW&WNW		98.8	B. Slightly foggy from 7 to
5	130.0		W by S&W N W		79.9	
						B to 11 P. M. Slightly foggy from 4 to 7 A. M., & 7 to 10 P. M.
6	135.2		W by S & S S W	···	65.4	B. Slightly foggy at 6 A. M., 7 to 8 P. M.
7	139.0		ssw&wnw		43.0	B. Slightly foggy from 6 to 8
8	127.0		S by W& N N W		71.3	A. M. B to 8 A. M. S to 12 A. M. B to 11 P. M., Slightly foggy from
9	129.0		N & N W	l	193.5	3 to 6 A. M. B. Slightly foggy at 7 & 8 P. M.
10	128.0		S E, ENE & NW		61.9	B. Slightly foggy from 7 to 11
11	124.7		NNE&NNW		94.4	B. Slightly foggy from mid-
12	122.0		NE&NW		45.0	night to 3 A. M. B. Slightly foggy from 7 to
19	122.2		N N E & W by N		33.0	11 P. M. B. Slightly foggy from mid-
		•••				night to 3 at 6, 7 & 11 A. M., &
14	131.2		[Variable W by N, W &		30.0	from 7 to 9 P. M. B. Slightly foggy from 5 to 8
15	133.0		SSW&W		143.8	A. M. B. Slightly foggy at 7 & 8 p. m.
	128.5		NE&ENE		74.8	B. Slightly foggy at 10 & 11
17	129.6	•	ENE&W by N		68.6	P. M. B. Slightly foggy at midnight
18	124.0		8 & W by 8		36.2	& 1 a. m. B to 11 a. w., ~;
						to 4 P. M. B to 11 P. M., Foggy from 4 to 9 A. M.

i Cirri,—i Strati, ^i Cumuli, _i Cirro-strati, ^i Cumulo-strati, _i Aimbi, `i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, i interior, B raia, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of January 1873.

Solar Radiation, Weather, &c.

	ar.	: ទី 🐇 . Wix	Ð	
Date.	Max. Solar	Prevailing direction.	fac.	General aspect of the Sky.
19	123.4	NNE&NE	lb 	Miles; 51.3 B to 5 A. M. S to 11 A. M., V i to 5 P. M. B to 11 P. M., Foggy from 3 to 10 A. M.
20	124.8	NE&ENE	١	120.1 \i to 2 A. M., \i to P. M.
21	128.0	ENE		O to 7 P. M. B to 11 P. M. 91.8 B to 1 P. M., Li to 6 P. M.
22	125 .0	ENE&E		B to 11 P. M. 81.8; B to 1 A. M., \(\si \) to 8 A. M. B to 11 A. M. \(\si \) & \(\ci \) to 5 P. M.
23	130.0	SE&E by N		B to 11 P. M. Chiefly B. Slightly foggy from 1 to 7 A. M. at 8 & 9 P. M.
24	131.0	E by N & N W		31.8 B. Slightly foggy from 5 to
25	133.5	NE&NNW		7 A. M. & 8 to 10 P. M. B to 12 A. M., \identity & _i to 6 P. M. B to 11 P. M. Slightly foggy
2 6	133 .0	SE&NNW		at 8 P. M. B to 4 A. M. O to 9 A. M. B to 11 P. M. Foggy from 1 to 9 A. M.
28 29	133.8 130.2 131.2 128.0	N N E & N N W N N E & N N W N by W& N N W N N W & N W	::	& 9 to 11 P. M. 78.1 B. 101.4 B. 108.3 B. 101.4 B. Slightly foggy at 10 & 11
31	133.0	NW&NE	i	33.2 B. Slightly foggy at 8 & 9 r.m.

[`]i Cirri,—i Strati, ^i Cumuli, ∟i Cirro-strati, ∼i Cumulo-strati, 〜i Nimbi, ∖i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D drizzle.

Abstract of the Results of the Hourty Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of January 1873.

MONTHLY RESULTS.

			
	•]	nches.
Mean height of the Barometer for the month			29.962
Max. height of the Barometer occurred at 10 a. M. on the	21st		30.160
Min. height of the Barometer occurred at 5 P. M. on the			29.801
Extreme range of the Barometer during the month	OLIZ.	•••	0.359
Mean of the daily Max. Pressures	•••	•••	30.038
	•••		29.903
Mean daily range of the Barometer during the month	•••		0.135
Mean daily range of the Datometer during the month	•••	•••	0.100
7 7 7 1 m			0
Mean Dry Bulb Thermometer for the month	•••	• • •	680
Max. Temperature occurred at 3 r m on the 7th		• • •	810
Min. Temperat ro occurred at 5, 6 & 7 v. v. on the 12th			53.0
Extreme range f the Temperature during the month	•••	•••	31.0
Mean of the daily Max. Temperature	•••	•••	77.9
Ditto ditto Min. ditto,			60.1
Mean daily range of the Temperature during the month	•••	•••	17.8
Mean Wet Bulb Thermometer for the month			61.8
Mean Dry Bulb Thermometer above Mean Wet Bulb Ther	 womete		6.2
Computed Mean Dew-point for the month	monic (•	56.8
Mean Dry Bulb Thermometer above computed mean Dew-	noint		11.2
Treat Dig Date Thermonicte above compared man Den-	I	•••	11.2
		I	nches.
Mean Elastic force of Vapour for the month			0.470
.,	•••	•••	4,2,0
		m	
		Trox	grain.
Mean Weight of Vapour for the month	•••	•••	5.19
Additional Weight of Vapour required for complete satur	ation		2.34
Mean degree of humidity for the month, complete saturation	being t	ınity	0.69
•			_
Man Man Salan maliation Thermoneter Court amounts			100.0
Mean Max. Solar radiation Thermometer for the month	•	•••	128.8
		Iı	ches.
Rained No. day,-Max. fall of rain during 21 hours .			Nil
Total amount of rain during the month			Nil
Total amount of rain indicated by the Gauge* attached to t	he ane	mo-	
meter during the month			Nil
Prevailing direction of the Wind	ÿ. W.	& N.	

^{*} Height 70 feet 10 inches above ground.

Abeliact of the Results of the Huurly Miteorological Observations taken at the S G O Calcutta in the month of Jan 1873 MONTHLY RESULTS

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of drys on which at the same hour when any particular wind was blowing it rained

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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR MARCH, 1873.

The Monthly General Meeting of the Society was held on Wednesday, the 5th instant, at 9 P. M.

T. Oldham, Esq., LL. D., President, in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced.

- 1. From the Government of Bengal, a set of six Photographs of Antiquities of Dinájpúr, by J. H. Ravenshaw, Esq., C. S.
- 2. From the Chief Commissioner of Mysore, 2 lithographed copies of each of the following transcripts in Sanskrit of the Gauja Agrahar and Koppa Gadde Sásanas.*

जाधत्याविष्कृतं विष्णे। वाराचं चो भितार्णवं। द्विणो चतदंष्ट्राये विशासं भुषनं वपः॥

खिल समस्प्रवनाथय वीष्ट्रध्वेवक्रभ महाराजाधिराज परमेश्वर परमभद्दारक हिलापुर वराधीश्वर खाद भगदत्तर्परायकानादत्तविवेधव्याण्डवकुलकमल्लमांगांखकदनप्रचल्छ-कल्किकोद्द्यग्रदमांगांख एकाङ्गवीर्णरङ्गधीर खश्चपतिराय दिश्चापितग्रज्ञपतिरायमंद्यन्द्रक्षमयः करात्रियमस्वकतलप्रदारिहयाकद्वप्रीटरेखारेवनसमनस्वग्चामप्रवेद्विष्णाप्रदेशभय-करित्यकरपराङ्गपनस्वगंवराह्लाञ्चनध्वप्रसम्पत्तां स्वाधित्वराज्ञतमानुद्रं सभय-करित्यकरपराङ्गपनस्वगंवराह्लाञ्चनध्वप्रसम्पत्तां स्विनापुरे सुखसक्वयाविनोदेवराज्यं करोति दिल्लाद्विक्षप्रयाचेर्यं विजयं करोमि तुङ्गभद्रादिद्वासङ्गमे श्रीहरिहर-देवपद्विधे कटकमुकुलितचेनमाने क्रव्यपचे स्वाधां सेमनारे भरकीनचने किन्नुप्रकरणे कत्ररायकसङ्गानी व्यतीपातिनित्ते स्वर्थपविक वर्षप्रमानस्व सेमनारे भरकीनचने किन्नुप्रकरणे कत्ररायकसङ्गानी व्यतीपातिनित्ते स्वर्थपविक वर्षप्रमुचं गोतमप्रामात् वाद्यक्षकद्वश्चाखेर्यगोतस्वर्गाविन्दपहवर्षन्तं । कञ्चद्वश्चाख्यवाश्चरोवस्वर्गावन्दपहवर्षन्तं कञ्चराखेर्यभारद्वाज्ञयावस्वर्गावन्दपहवर्षन्तं । कञ्चद्वशाख्यवाश्चर्यावस्वरेवस्वर्गावन्द्वस्वस्वर्गावन्द्वस्वस्वर्गावन्द्वस्वर्गाच्यक्षम् कराति—

^{*} See Proceedings for December, 1872, p. 193.

चक्रवर्तिमेवि पचात्रपराय स्वतुखासम्बलदगद्दिमे चङ्कदण्डलमाड्विष्टिमुनीस्तंक चर्छ-भागतेजस्रांस्यगातमपाम तन्त्रध्यप्रविष्टनाड नाडवित्र बाडवित चिक्रचारिक दांचं दूरतसंगेरे चित्रगढ ते। गर्गुञ्च चासूद वासेनचित्र संप्रगासुकिरसंप्रगाडपडु रवं दादग्रपानात् सर्व समस्य भारापूर्वकं दत्त-तस्य यामस्य सीमान्तराणि कथन्त सान्यद्सीमे गैतिमयामद्विवृत्त वितिसिसीमासञ्चितिकातसङ्गम- तथा दिखलमवलाके गैतिमयामदसालियूद दे सीमे यं विगाल- तथा पश्चिम-गातमपामद्सालियूरदेशोमेलातपाय- तथा दक्षिणगातमपा-मद्शालियू रहेशीमे जयं गुंड़े विद्यतटाक-तथा द्विणगैतिमपामद्शालियू रहेशीमे क्षातप्राप्य- तथा दक्षिणयाम काग्नेयगैतिमयामद्वालियूरकाखपुरद्विमन्धिमोमे जभय-गिरिमध्ये याघ्रनगेहि- तथा पश्चिममवलोके गैातमयामदकाखपुरददेशोमे कडवद-कोख- तथापियमगै।तसयामदकाखपुरददेशीमे सञ्चरिखे।तप्राप्य-तथा पियमगै।तस-पामदमासं दूरिनसिथसीमे केतकीकडू- तथापिसमौतमदद्वेतीमे मास्यंदूरदेसीमकमा-कुमारेडि- तथापिकम्-गैातमयामदमान्धं दूरमंधास्तरदिवसिसीमे खबकक्वातप्राय-तथा पश्चिमयामनैक्टलगातमयामद क्रशासुरगुंदचासददनिस्थिसोने स्ववसनदीसातसङ्ग- स- त जत्तरसवस्रोको गै।तमपासद्दासगुद्देशीमे स्रोतप्राप्य- तथा जत्तरगे।तमपासद-चासगृदद्विदरगुं जियविस्थिसीमेजभयगुडु- तथा जत्तरगीतमपामविदरगुंजेयदेशीमे चीरकोछ- तथा जनरगैतनयामद्विदरगंजिश्विगर्यशेखलविष्विषोमे खेतिप्राय-तथा उत्तरगातमवायवगातमगामद्त्रिगर्थपासुँदेशीमे सन्धिकरियद्वोत्ते – तथा पूर्वमव-क्षेकि ग्रीममयामद्विगर्थपोक्तक्रदेशीमं केतक्षेक्षड्विष्टयमत्ति— तथापूर्वगैतिमयामद्वि गर्थेपाललद्वेसीमेकंगोल- तथा वेगोतमयामद्विगयेपाललविलियूरविसन्धिमेकच-गरु- तथा पूर्वगातमपामद्वि ख्रिय्रदेशीमे गिरिप्राण- तथा पूर्वगातमपामद्वि जियूरमः डबद्विसन्धिमीमीगरिजत्तरे सुरकोन्छ-पूर्वेगै।तमग्रामदमडबद्वविधूरविसन्धिमीमे विदर-**भचूतजीतमयामद्वित्र्**युरद्वेशीमे मारिटयूर्वसचर्ये तत्त्राण्य पूर्व र्रमान्यशोमा समाप्तिः॥

षामान्याऽयं घर्मभेतुर्ख्याणां काले काले पालनोयां भविद्धः।
सर्वानतान् भाविनः पाणिवेन्द्रान् भूयां भूया याचते रामचन्द्रः॥ ६॥ ;
दानपालनयार्भभे दानाच्छ्रेयाऽनुपालनं।
दानात् खर्ममवाभाति पालनाद्युतं पदं॥ ६॥
मदंग्रताः परमचोपतिवंग्रजा वा ये भूमिपास्ततमुञ्जलधर्भीचनाः।
मदर्मनेव सततं परिपालयन्ति तत्याद्पक्षजमसं ग्रिरसावदानि॥

जयत्याविष्कृतं विन्धोर्वाराष्टं चोभितार्कवं। द्विकोञ्जतदंष्ट्रापे विद्यानं भुवतं वपुः॥

सन्ति धमस्तुननात्रयं त्रीष्टव्योवकाणं मचाराजाधिराजपरमेश्वरपरमभद्वारकचित्रना-पुरवराषीश्वर चारोचकभगद्गरिपुरायकामाद्यावैरिवेधयपाखवकुलकमल्लमातीखकदन-प्रचयक्तिककोद्यवय्वमातीख स्काङवीर रचरङ्गोर चश्चपतिराच दिशापद्वगव्यतिराय

चं चारकनरपतिरायमसकात सप्तचारिसामनस्याचामरके।क्वचातुर्दिसमयक**रच च**पुटचा व-पुट ईसरमुखकमस्विनिर्गतसुधसास्त्रप्रश्रामीसाद्तरस्वप्रविष् कारंटकस्वस्निमार्ग्नु-नादिमन्त्रवयसिंदप्रसिद्धसमुद्यनिमतपादारिवन्द्विरायकुलविलयकासामस्रीनत्वकरपः राज्ञनापुत्र सुवर्धवराचलाञ्चनध्वजसमलराजावलिविराजितसमालक्षुत त्रीसे।सवंग्रीञ्च-वपरिचितचक्रवर्ति तसुन जनमेजयचक्रवर्ति इखिनाप्रे सुखमंक्रवाविनोदेन राज्यं कराति दिम्लियं करामि तुक्रभद्राचित्रासक्तमे त्रीचरिचरेश्वरसिवी कटकमुकुलित-चैनमाचे क्रव्यपचे मामवारे भरकीमडानचने चङ्गानिव्यतिपातनिमिन्ने पर्धयानं करोमि वनवासे पतीच्क्सस्थमधासपण् एदनाद स्थातरत्तनाध्ये पुरंशबद्रेययामत्राञ्चक्कन्नडसाखेय खानेयगोनद् माधवपृष्टवर्धनद् कनडसाखेय वसिष्ठगोनदसङ्करघनिसद् कनडसाखेयत्रोनस-गोनद्योगे सरपष्टवर्धनद कनडपाखेयविश्वामिनगोनद्वी व्यदी चितद चल्पमजनानागोन-दसच्चद्वयत्राद्मणं सर्पयामपूर्णाङ्कतिसमर चित्रवादपूर्वतं चक्रवर्तिमेचिपचाक्रपसायक्रव-सुखासनवस्याद्गे चंकद्व्वव्य अष्टतागतेमसाय पर्वं नमस्य वागिप्स्यो।डेय पामान-माभो प्रविष्टवे।सानचिक्तनिष्टक्कानेद्देय कोरकोडी श्रद्धगेंडेयकोडस्त्रीकरेजरगेव्हण्कुल्वस्रोक-इडेयचली एवं द्मयामात्धारापूर्वकं दल तस्य पामस्य सीमान्नराणि क्षंद्रसान्य-दसीमे पुष्पगञ्जयकान्नापुरदस्रारेयनिसन्धिसीमेखोतसङ्गमतयादिक्तणमनलोके पुस्पगेट्टेय चारयदेशीमे सं।तत्राप्य तथा दिचणपुरागहेयदारय उद्रेयिवसमीसिमे तनक तथा दिचण-पुसागर्चेय जहरेयदसीमेबातप्राप्यदिवणपामबाग्नेयपुसागे द्वेय जहरेयबदसीमेयने।तथा तवक्रतथा पश्चिममवलेको पुरागे द्वेयकदिला देशिमेमिनियको लत्तथा पश्चिमपुरागे द्वेयकदः ज्ञियतवनिचियनिधनोधीमेबाज्ञयकोज्ञ तथा पश्चिमपृष्यमे चुंयतवनिधियदेसीमे एजवदकडु तथा पश्चिमपामातुनिरदितपुष्यमे द्वेयतवनिधीयते क्रिविस्थीपीमे मालेयुमोर्ड तथा जनरमवलेको पुष्पाञ्जेयतेकुरहेमोमेखाणावततेवक्रतथा जनरपुष्पारे द्वेयतेकारकूलगमनि-सन्धिशीमे मागेव तथा उत्तरपुष्यगे द्वेयकूलगनदेशिमे उंगगुद्धे तथा उत्तरपामवाययपुष्प-गे द्वेयकालगनडी सकर विस्थितिमेसीत तथा पूर्वमवस्त्रीको पुष्पगे द्वेयवसकर देखिमेसीत-प्राप्य तथा पूर्वपृष्यमञ्जयनमञ्जरताणमुख्यिचिसन्योसीसेपालमाल तथा पूर्वपृष्यमञ्जयतास ग्रथेयदेशोमेखे।तवत्र तथा पूर्वप्यमेश्वेयताणगुर्येयतिमन्त्रिसीमेखे।त तथा पूर्वपुष्यमञ्ज्ञ-कानापुरदद्वेचिनेपूर्वं तथानुसान्यसीने समाप्तः॥

> षानान्ये। यं घर्म मेतुर्र्यपाणां काले काले पाछनीया भवद्भिः। सर्वानेतान् भाविनः पार्थिवेन्द्रान् भूयो भूयो याचते रामभदः॥
>
> अस्तां परद्भां वा यो चरेत वसुन्धरां।
>
> विद्यवेषस्वाण् विष्ठायां जायते जि(क)िनः॥

(त्रच्यसं कि) विषं मेर्र न विषं विषमुच्यते । विषमेकाकिनं चन्ति त्रच्यसं पुचपीनकं ॥

जोरामनाषदेदभुमास**न्द**स

- 3. From the Editor, A copy of Meghaduta with commentaries, edited by Bábú Pránanáth Pandit.
- 4. From the Director General of Geological Survey of England and Wales, A copy each of several earlier Memoirs of the Survey with maps, &c.
- 5. From the Chief Signal Officer, Washington, U. S. Three copies of the tri-daily Weather Bulletin.
- 6. From F. H. Pellew, Esq., C. S., specimens of wood and soil dug out near Baddibati, District Húgli.

The following letter accompanied the donation.

"I send you three specimens. 1st of wood cut from a prostrate stem of a tree found in a stratum about five feet below mean sea level—or at the level of low tide—and about 25 feet below the present surface of land at Baddibati; 2nd, of twigs found in the same stratum; and 3rd, of some consolidated earth at a little higher level—believed by some to be of vegetable origin, though I think it is only clay. These were found in excavations for the Húghli drainage works, which I visited this morning. The logs or prostrate stems are pretty numerous, the wood, as you will observe, is quite soft and is cut clean through with the spade; below the stratum is a soft greasy blue clay,—above are alternate strata of clay and sand. I have asked the engineer to look for littoral shells, which I looked for, but could not find. The prostrate trees look like trees stranded on a muddy beach of shore of a deltaic estuary. I have seen hundreds such near the mouths of the Sunderban khalls lying half buried in the same sort of mud.

The importance of the 'find' lies in the fact that it proves, so far as it goes, that the Delta has not sunk since the deposition of this stratum.

I would suppose that the land at Baddibati was then low estuary land with tidal creeks, such as the land east of Saugor Island is now, and that the Damúda and Ganges have since that period simply covered over this low land with strata of sand and clay at the same time pushing forward the shore. In other words that there has been nothing abnormal, no subsidence, at any rate.

This is contrary to the evidence afforded by other borings, but the question is whether the levels in the other cases were accurately taken. If they were, then the upright trees, &c. discovered far below the present sea level in those other cases, must be much more ancient than these— • or else there must have been partial subsidences confined to particular localities."

The President remarked on the interest attaching to all such notices of change of condition of surface, more especially when it was possible, as in this case, to determine the levels accurately. But he would advise much caution in attempting to apply conclusions derived from such very local changes in a great delta to the delta at large. Such appearances of elevation

or depression are often very deceptive, and require great care in their application.

6. From the Government of India, a set of 19 works on the East African dialects by Dr. Steere of the English Mission in Zanzibar.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected Ordinary Members—

A. Cappel, Esq.

G. W. Barclay, Esq.

A. J. Hughes, Esq., C. E.

Bábu Satyadayála Banerjea, B. L.

The following are candidates for ballot at the next meeting-

Frederick Jones, Esq., C. S., proposed by J. Wood-Mason, Esq., seconded by G. Nevill, Esq.

Edmund White, Esq., C.S., proposed by A. M. Markham, C. S., seconded by H. Blochmann, Esq., M. A.

Robert Turnbull, Esq., proposed by Bábu Rájendralálá Mitra, seconded Col. A. S. Allau.

Babu Umesh Chunder Dutt, proposed by Col. A. S. Allan, seconded by Bábu Rájendralála Mitra.

T. T. Blissett, Esq., proposed by L. Schwendler, Esq., seconded by T. Oldham, Esq., LL. D.

J. W. Curtoys, Esq., has intimated his desire to withdraw from the Society.

The President reported on the part of the Council that the following gentlemen have been appointed to serve on the several Committees of the Society:—

FINANCE.

Bábu Rájendralála Mitra.

L. Schwendler, Esq.

Col. H. Hyde, R. E. Col. A. S. Allan.

LIBRARY.

The Hon'ble J. B. Phear. Bábu Rájendralála Mitra. Col. H. Hyde, R. E. Col. A. S. Allan. W. L. Heeley, Esq., C. S. J. Anderson, Esq., M. D.

J. Wood-Mason, Esq.

G. Nevill, Esq.

Dr. Mahendralal Sirkar.

L. Schwendler, Esq.

PHILOLOGY.

The Hon'ble E. C. Bayley, C. S. I.

Bábu Rájendralála Mitra.

W. L. Heeley, Esq., C. S.

C. H. Tawney, Esq.

Major General A. Cunningham, C. S. I.

Rev. K. M. Banerjea.

Bábu Gour Dass Bysack.

Dr. Mahendralál Sirkar.

Moulaví 'Abdul Latif Khan Bahádur.

Moulaví Kabíruddin Ahmad Sáhib.

J. Beames, Esq.

F. S. Growse, Esq.

Babu Dvijendranáth Tagore.

NATURAL HISTORY.

J. Ewart, Esq., M. D.

J. Anderson, Esq., M. D.

W. S. Atkinson, Esq.

J. Wood-Mason, Esq.

G. Nevill, Esq.

H. F. Blanford, Esq.

W. T. Blanford, Esq.

V. Ball, Esq.

H. B. Medlicott, Esq.

D. Waldie, Esq.

G. E. Dobson, Esq., B. A., M. B.

Dr. Mahendralál Sirkar.

PHYSICAL SCIENCE.

His Excellency Lord Napier of Magdala, G. C. B, G. C. S. I.

Col. H. L. Thuillier, C. S. I.

Col. H. Hyde, R. E.

H. F. Blanford, Esq.

D. Waldie, Esq.

J. Wood-Mason, Esq.

L. Schwendler, Esq.

COINS.

Hon'ble E. C. Bayley, C. S. I.

Bábu Rájendralála Mitra.

Major-General A. Cunningham, C. S. I.

Major F. W. Stubbs.

Rev. M. A. Sherring. J. G. Delmerick, Esq.

THE COMMITTEE OF PAPERS.

The Members of Council.

The President said that the letter he was about to read to the members of the Society would explain itself. They were aware that a claim submitted to the Government of India by the Council for rent of the house they occupied as a Museum, from the date at which Government had contracted to relieve the Society of these collections, had been for a long time under the consideration of Government. They would therefore hear the result with great satisfaction at finding that Government had assented to the claim of the Society in full.

No. 68.

From J. Geoghegan, Esq., Under Secretary to the Government of India, Department of Agriculture, Revenue and Commerce.

To the Honorary Secretary to the Asiatic Society of Bengal.

Calcutta, dated 1st March, 1873.

(Industry, Science and Art.)

SIR,—With reference to your letter to the address of the Government of India in the Home Department, No. 47, dated the 29th January, 1872, on the subject of compensation for the loss of house accommodation consequent on delay in completing the new Museum building at Calcutta, I am directed to say that after full consideration of the circumstances of the case, His Excellency the Governor-General in Council is pleased to accede to the request of the Committee of the Asiatic Society, and to grant the Society a special allowance of Rs. 400 per mensem from the date fixed by law for the removal of the Museum collections, up to the date on which they may actually be removed.

I have the honor to be,
Sir,
Your most Obedient Servant,
J. GEOGHEGAN,

Under-Secretary to the Government of India.

Read a letter from F. S. Growse, Esq., M. A., C. S., on the proportion of the Muhammadan and Hindú population of the village of Dotána near Mathurá.

'On the high road between Delhi and Mathura, and about 22 miles from the latter city, is the village of Dotána, noticeable in this peculiarly Hindú part of the country for having as many as 715 Muhammadans, out of a total population of 1411. Scattered about in the fields by the road side are a number of Muhammadan buildings, mosques, tombs and dargáns, which though of no architectural beauty, are sure to attract the notice of the traveller. John de Laët in his "India Vera" (1631) refers to it though he wrongly calls it Akbarpur, which is the name of the next village—and says "This was formerly a considerable town; now it is only visited by pilgrims who come on account of many holy Muhammadans buried here." Annual fairs are still held in honour of three of these holy men, by name Hasan Shahid, Sháh Nizám-ud-dìn and Pír Shakar-ganj, alias Bábá Farid.* The present zamindárs, who are in rather reduced circumstances, can tell me nothing about them and probably they were only local celebrities.'

The following papers were read-

1.—Note on two Coins from Kúusámbhi.—By the Hon'ble E. C. Bayley, C. S. I., C. S. (Abstract.)

The Hon'ble E. C. Bayley explained to the meeting the legends of two ancient coins received by him from Káusámbhi, a ruined city in Alláhabád District. They appear to belong to the second century before Christ.

A wood-cut of the coins is in course of preparation.

2.—The History of Pegu.—By Sir Arthur P. Phayre, K. C. S. I., C. B. (Abstract.)

This paper on the history of Pegu is chiefly derived from a MS. history, written in the Talaing language. It includes the early legends as to the building of the city of Tha-htun, called also Suvarna Bhumi, by colonists from ancient Kalinga or Talingáná. This was before the death of Gautama Budha, B. C. 545. Pegu was founded by emigrants from Tha-htun A. D. 573, and the present paper follows the history of that kingdom until the death of king Rídzádirít, in the year 1421 A. D.

The author also discusses the physical characteristics of the Taláings (a word derived of Talingáná) or Mon people, and the affinities between their language and that of the Munda Kols of Chutiá Nágpúr.

The reading of the following paper was postponed.

On the identification of certain Aboriginal Races noticed in Col. Dallon's Ethnology with those mentioned in Sanskrit works.—By Ba'bu Rangala'l Banerjea, Deputy Magistrate, Húgli.

The receipt of the following communications was announced-

- 1. New Burmese Plants, P. II., by S. Kurz, Esq.
- 2. On the Indian species of the genus Thelyphonus, by Dr. F. Stoliczka.
- 3. Notes on Malayan Amphibians and Reptiles, by Dr. F. Stoliczka.
- 4. The Initial coinage of Bengal, P. II., by E. Thomas Esq. F. R. S.
- * Evidently 'jawabs' of the tombs of Hasan, son of 'Alí, Nizamuddin Aulia of Dihlí, and Farid ud-din 'Attar of Pak Patan. The Editor.

LIBRARY.

The following additions have been made to the Library since the last meeting held in February last.

** Names of Donors in capitals.

Presentations.

Bullétin de la Société de Géographie, Novembre, 1872.

Vivien de Saint Martin.-Essai sur les Castes dans l'Inde, par M. Esquer.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Journal Asiatique, Juin, Juillet, Août-Septembre, 1872.

- M. Joseph Halévy.—Traduction des inscriptions Sabéenes, suivies de trois appondices.
- M. J. Oppert.—Pasargades et Mourgháb.—Interprétation d'une inscription d'Artaxerces II, Mnémon, trouvés à Suse. M. G. Pauthier.—E'tude de l'alphabet Cambodgien et manuel pratique de la langue Cambodgienne, par M. G. Janneau.
- M. Francis Chemier.—Chronique royale du Cambodgo. M. Ch. Clermont-Ganneau,
 —Résultats topographiques et archéologiques des fouilles entreprises à Jérusalem par
 le Palestine Exploration Fund. G. Carrez.—Ueber das Saptaçathakam des Hâla,
 Ein Beitrag zur Kenntinss des Prákrit, von Albrecht Weber. S. Guyard.—Note sur
 le chapitre du Farhang i Sjehangert relatif à la dactylonomie.

THE ASIATIC SOCIETY OF PARIS.

Entomologische Zeitung, herausgegeben von dem Entomologischen Vereine zu Stettin, Jahrgang 1840-1872.

THE ENTOMOLOGICAL SOCIETY OF STETTIN.

Magnetische und Meteorologische Beobachtungen auf der K. K. Sternwarte zu Prag im Jahre, 1869-1871.

THE IMPERIAL OBSERVATORY OF PRAGUE.

Bollettino Meteorologico ed Astronomico del Regio Osservatorio dell Universita di Torino, Anno 1872.

THE ROYAL ACADEMY OF SCIENCES OF TURINA

Katalogos ton Arkaion Nomismaton, Tomos A'; Apologismos toy Ethnikoy Arkailogikoy Moyesioy.

·THE NATIONAL LIBRARY OF ATHENS.

Ofversight af Kongl. Vetenskaps—Akademiens Förhandlingar, 1869, 1870.

Kongliga Svenska Vetenskaps-Akademiens Handlingar, Bd. 7-8-9.

Lefnadsteckningar öfver Kongl. Svenska Vetenskaps Akademiens, Bd. I Meteorologiska Jakttagelses i Sverige, 1867, 1868, 1869.

THE ROYAL ACADEMY OF STOCKHOLM.

The Journal of the Anthropological Institute, Vol. II, No. II.

J. Park Harrison.—On the artificial enlargement of the Ear-lobe. A. W. Franks.
—Description of the Tattooed man from Burmah. R. F. St Andrews St John.—A.

short Account of the Hill Tribes of North Aracan. Commander H. S. St John.—The Ainos: Aborigines of Yeso.

THE ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

Journal of the American Oriental Society, Vol. X, No. 1.

Fitz-Edward Hall.—Thirtoen inedited letters from Sir W. Jones to Sir C. Wilkins. Rev. S. A. Rhea.—Brief Grammar and Vocabulary of Kurdish Language of the Hakari District. W. D. Whitney.—Collation of a second manuscript of the Atharva-Veda-Prátiçákhya. Rev. A. Bunker.—On a Karen Inscription Plate.* Rev. F. Mason.—The Pali language from a Burmese point of view. Rev. W. M. Thomson.—Traces of Glacial Action on the flank of Mt. Lebanon. Exer. Abbot.—On the Comparative Antiquity of the Simuitic and Vatican Manuscripts of the Greek Bible.

THE AMERICAN ORIENTAL SOCIETY.

Journal of the Royal Geographical Society, Vol. 41.

G. W. Hayward.—Letters on his explorations in Gilgit and Yassin—Captain S. Osborn.—The Geography of the bed of the Atlantic and Indian Oceans and Meditorranean Sea. Mayor T. G. Montemarie.—Report of the Miraa's Explorations from Cabul to Kashgar. Capt. S. B. Mes and Werner Maninger.—Account of an Excursion into the Interior of Southern Arabia. Capt. A F. P. Harcourt—On the Himalayan Valleys—Kooloo, Lahoul and Spiti Major E. B. Sladen.—Exploration vist the Irrawaddy and Bhano to South-Western China. Major General Abramof.—The Principality of Karategin. H. L. Jenhus.—Notes on a trip across the Patkoi Rango. W. Ellis.—Results of the Observations taken by Mr. R. B. Shaw during his journey to Yarkand in 1870.

Proceedings of the Royal Geographical Society, Vol. XVI, Nos. 3 and 4. No. 3.—De Cospique,—Northern Borneo. Blakeston.—Journey round the Island of Yezo. Morgan.—Palladus' journey through Manchuria. Ross.—Journey through Mekran. Lovett.—Survey of the Perso-Kelat Frontier. Shaw.—Position of Pein, Charchand Lob Nur &c. Moretyone ver.—A Havildar's Journey from Chitral to Faizabad. Lovett. Route from Shiraz to Bam

No. 4.—Address at the Anniversary Meeting of the Royal Geographical Society, by Major General Sir H. C. Rawlinson, K. C. B.

Classified Catalogue of the Library of the Royal Geographical Society to December, 1870.

THE ROYAL GEOGRAPHICAL SOCIETY OF LONDON.

Journal of the Chemical Society, August, Sept. and Oct. 1872.

J. A Wanklyn.—New tests for some Organic fluids. II, Deacon.—On Deacon's Method of obtaining Chlorine as illustrating some principles of Chemical Dynamics.

THE CHEMICAL SOCIETY OF LONDON.

Transactions of the Zoological Society of London, Vol. VIII, part 2.

Arthur Viscount Wolden.—A list of the Birds known to inhabit-the Island of Celebes, with an Appendix.

Catalogue of the Library of the Zoological Society.

Revised list of the Vertebrated Animals in the gardens of the Zoological Society of London, 1871.

THE ZOOLOGICAL SOCIETY OF LONDON.

^{*} See also Proceedings for 1872, page 138.

Catalogue of Shield Reptiles in the British Museum, parts 1 and 2, by J. E. Gray.

Catalogue of the specimens of Hemiptera Heteroptera, part V, by F. Walker.

THE TRUSTEES OF THE BRITISH MUSEUM.

Memoirs of the Geological Survey of Great Britain and of the Museum of Economical Geology, London, Vols. 1-1V. and June 1856-1870.

Geological Report on Londonderry and parts of Tyrone and Farmanagh.

Reports on the Geology of Jamaica.

THE GEOLOGICAL SURVEY OF GREAT BRITAIN AND IRELAND.
Proceedings of the Institution of Mechanical Engineers, 1857-1869
and 1870-72.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.
Les Religiouses Bouddhistes, par Mmc. Mary Summer.

THE AUTHOR.

Meghadutam, edited by Pránanáth Pandit.

THE EDITOR.

The Calcutta Journal of Science, Nos. 9 and 10.

THE EDITOR.

Grammar of the Sindhi Language by Dr. E. Trumph.

THE RT. HON'BLE THE SECRETARY OF STATE FOR INDIA. Selections from the Records of Government, No. 111.

THE GOVT, OF N. W. PROVINCES.

Anjili ya Bwana wetu na Mwokozi Isa Masiya kwa Mattayo (Gospel of St Matthew).

Katekisimo ya Kanisa Ingrezi (English Church Catechism).

Masoma ya Maandiko Matakatifu (Swaheli Scriptural Reading Lessons). Zaburi za Daudi (Psalms of David).

Chuo cha Kuya endeleza Maneno za Kinuguja (Swaheli Spelling Book).

Sala za Subni na Jioni (Morning and Evening prayers).

Katekisimo Fupi (Short Catechisms).

Nymbo za Dini (From Ephrem Syrus).

Mashairi ya Kimasihiya.

Kitab u cha Ruth. (Book of Ruth.)

Kitabu cha Nabii Yona (Book of Prophet Jonah.)

Utenzi wa wokovu.

The First Sixteen Psalms translated into Swaheli.

Some account of the Town of Zauzibar by E. Steere.

Collections for the Nyamwezi Language by E. Steere.

Collections for a hand-book of the Shambala Language.

Collections for the Yao Language, by E. S. Steere.

Swaheli Tales, by E. Steere.

Hand-book of the Swaheli Language, by E. Steere.

THE GOVERNMENT OF INDIA.

Exchange.

The Athenaum for December 1872.

Nature, Nos. 166-168.

Purchase.

Revue Archéologique, Decr. 1872.

Comptes Rendus, Nos. 24, 25, 26.

No. 24.—M. J. Montier.—Sur les effets thermiques de l'aimantation. M. Th. Du. Moncel.—Sur les courants accidentels qui unissent au sein d'une ligne télégraphique dont un bout reste isolé dans l'air.

Nos. 25, 26.—M. C. M. Gariel.—Sur la distribution du Magnétisme dans les aimants. M. Ch. V. Zenger.—Nouvelle Note sur l'action des conducteurs disposés symétriquement autour d'un électroscope. M. Renault.—Sur une application nouvelle de la réduction des sels d'argent pour obtenir la reproduction de dessins.

American Journal of Science, No. 24, December, 1872.

L. M. Rutherford.—On the stability of the Collodion Film. R. Gidgray.—On the relation between colour and geographical distribution of Birds. T. Lecurte—A Theory of the formation of the great features of the Earth's surface.

PROCEEDINGS

ASIATIC SOCIETY OF BENGAL,

FOR APRIL, 1873.

A Meeting of the Society was held on Wednesday, the 2nd instant, at 9 P. M.

The Right Rev. the Lord Bishop of Calcutta in the chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced-

- 1. From the author, a copy of a printed paper entitled 'Additional Notes on the Raptorial Birds of North Western India,' by A. Anderson, Esq.
- 2. From the Government of India in the Home Department. A set of six photographs of Antiquities in Dinájpúr, taken by J. H. Ravenshaw, Esq., C. S.
- 3. From the Government of Bengal, a copy of a photograph of a pillar dug out at Bannagar in Dinájpúr, taken by J. H. Ravenshaw, Esq., C. S.
- 4. From the Government of India, Home Department, copies of extracts from the Proceedings of the Chief Commissioner of British Burmah on the subject of Archaeological remains in that Province.
- 5. From the Surveyor-General of India, a copy of the General Report of the Topographical Surveys of India, 1871-72.

The following gentlemen duly proposed and seconded at the last meeting, were balloted for and elected Ordinary Members—

- F. Jones, Esq., C. S.
- E. White, Esq., C. S.
- R. Turnbull, Esq.

Babu Umésh Chunder Dutt.

T. T. Blissett, Esq.

The following are candidates for ballot at the next meeting-

- G. R. C. Williams, Esq., C. S., Muzaffarnagar, proposed by F. S. Growse, Esq., C. S., seconded by H. Blochmann, Esq., M. A.
- H. B. Armstrong, Esq., Her Majesty's 1/14th Regiment, proposed by G. E. Dobson, Esq., M. A., M. B., seconded by Capt. J. Waterhouse.

W. Mackay, Esq., C. E., Port Blair, proposed by Dr. Stoliczka, seconded by V. Ball, Esq.

The Rev. John Hector, M. A., proposed by the Rev. W. Fyfe, M. A., seconded by D. Waldie, Esq.

The Rev. J. P. Ashton and Dr. C. F. Tonnerre have intimated their desire to withdraw from the Society.

Read a letter from Dr. Oldham informing the Council of the necessity he was under of resigning the office of President on account of his being obliged by ill-health to take sick-leave to Europe.

Also the following resolution passed by the Council on Dr. Oldham's resignation—

Resolved that the Council of the Asiatic Society record their sense of the obligations the Society is under to Dr. Oldham for the zeal and ability with which he has discharged the office of President as well as for his unremitting exertions to promote the objects and interest of the Society during the long period of his membership since 1851, and express their deep regret at the cause which now compels him to resign the office of President. They also earnestly hope that he may he able to return to India with renewed health and strength, and resume his place among them once more.

Colonel Thuilliar on behalf of the Council begged to bring to the notice of the meeting the severe loss the Society was sustaining by the resignation of their esteemed President, Dr. Oldham. He felt certain that he was expressing the opinion of the Society at large, when he regretted the departure of their President, and more especially owing to the cause which necessitated his leaving India. He thought the Society was deeply indebted to Dr. Oldham not only for his valuable services as President of the Society, but for many years of carnest labour in the cause of Science which was brought to bear on the interests of the Asiatic Society. He wished they might see Dr. Oldham back again with renewed health and vigour, when they might again have the great benefit of his services.

The Council reported that consequent on Dr. Oldham's resignation, they had elected Col. H. Hyde, R. E., President of the Society, and Dr. S. B. Partridge a member of Council, subject to confirmation by the meeting.

The proposed elections were carried unanimously.

They also reported that they had appointed Mr. W. McLaren Smith, M. A., a member of the Library and Physical Science Committees.

The following papers were read-

I. The History of Pegu (continued).—By Major General SIR ARTHUR P. PHAYRE, K. C. S. I., C. B.

(Abstract.)

This paper is a continuation of the 'History of Pegu' read at the last meeting. It commences with the history of Radzadirit's successors (end of

the fourteenth century) to Taká-rwutbi who, in 1540, was deposed by Tabeng Shwéhti, king of Táungu. The article also contains comprehensive and interesting notes on the early European fravellers that visited Burmah, and an account of the dealings of the Portuguese.

II. Studies in the grammar of Chand Bardai.—By JOHN BEAMES, Esq., B. C. S.

(Abstract.)

Mr. Beames having published the first fasciculus of his text edition of this ancient poet, has collected in this paper the grammatical peculiarities which Chand's language exhibits. The illustrations are chiefly taken from the 1st, 19th, 64th, and 65th books.

In the preface, Mr. Beames remarks on the MSS, which he has consulted. Historically, he says, the Baidlah MS., of which the Asiatic Society has a copy, has the best right to be considered the representative of the original text. Tod's and Caulfield's MSS., belonging to the Royal Asiatic Society, were made for the officers whose names they bear in the second decade of the present century. The Bodleian has no colophon, but agrees with Tod's. The Agrah MS. is the worst, and is most carelessly written of all. As Caulfield's MS, and the Bodleian are locked up in English libraries, they cannot be used; and Mr. Beames and Dr. Hoernle take, Tod's MS, as the basis of their text edition.

Mr. Blochmann said-

At the January meeting of the Society, I exhibited Arabic and Persian inscriptions from various places in Bengal, received from General Cunningham, Mr. W. L. Heeley, Mr. E. V. Westmacott, Dr. J. Wise, and Mr. Walter M. Bourke, and shewed the importance of mural evidence for the elucidation of Bengal history. I have since examined our collection of coins, in order to procure additional testimony, and have found several coins of great value. These coins are now in the hands of an artist; and a plate of such as are new, will be issued together with my paper on the inscriptions.

The coins are-

- (1). Four specimens of 'Iwaz coins, as lately published by Mr. E. Thomas in his Second Part of the 'Initial Coinage of Bengal.'
- (2). Three silver coins of Shihábuddín Abul Muzaffar Báyazíd Sháh, of A. H. 812, and 816. Is this the Dínájpúr Rájah Ganesh (Kanis)?
- (3). Three silver coins of Jaláluddín Abul Muzaffar Muhammad Sháh, of A. H. 818 and 821.
 - (1). One BárbakSháhí, different from the one published by Marsden.
- (5). One FathSháhí, of A. H. 886—shewing the same date as Dr. Wise's inscription of that king. *Mint town*, Fathábád.

- (6). Three NucratSháhís, of A. H. 922 and 927. These coins were struck by Nucrat Sháh during the lifetime of his father, which probably points to a successful rebellion. The mint town is Khalífatábád, or II avelí, in Southern Jasar District, on the northern edge of the Sundarban, near Bágherghát. I have identified this town with the hitherto unknown Cuipitavaz on De Barros' Map, one of the "lost towns" of the Sundarban.
 - One coin of Fírúz Sháh (III), son of Nuçrat Sháh, of A. II. 939.
 Mint town Husainábád.

In connexion with these additions to our knowledge, I may also state that the Society has since January received the following inscriptions, which will be immediately published.

1. From Mr. J. G. Delmerick, Delhi.

One Balban Inscription from Sonpat, A. II. 670.

Two Ibráhím Lodí Inscriptions, from the same place, of A. H. 928, and 930.

A most interesting inscription in Sanskrit, of Samwat 1381, from Hariyana, which has been translated by Bábu Rájendralála Mitra.

2. From Bábu Ganga Parsad, Murádábád.

One Bábar Inscription, of A. H. 933, from Sambhal.

One Akbar Inscription, of A. H. 980, from Amrohah.

One Shahjahan Inscription, of A. H. 1051, from Amrobah.

One Shahjahan Inscription, of A. H. 1067, from Sambhal.

3. From Dr. J. Wise, Dháká.

A collection of Inscriptions from Sháh Jalál's tomb at Silhat. The oldest are a Yúsuf Sháhí and a Husain Sháhí; the most recent belong to Aurangzíh's reign. Dr. Wise has also sent an interesting note on this legendary saint and conqueror of Silhat.

Also, an inscription from 'Azímnagar, Dháká District.

4. From Mr. Walter Mr. Bourke.

Five inscriptions from Rájmahall.

The receipt of the following communications was announced -

- 1. Notes, translation and reading of a set of three copper plate inscriptions found at Sambalpúr. By Bábu Pratápachandra Ghosha.
- 2. On the History of Pegu, No. II.—By Major General Sir A. P. Phayre, K. C. S. I., C. B.
 - 3. Studies in the grammar of Chand Bardai—By John Beames, Esq., C.S.
- 4. On the genera Murina and Harpyiocephalus of Gray. By G. E. Dobson, B. A., M. B.

LIBRARY.

The following additions have been made to the Library since the Meeting held in March last.

Presentations.

** Names of Donors in Capitals.

Monatsbericht, September and October, 1872.

Peters.—Über den Vespertilie calcaratus, Prinz zu Wied, und eine neue Gattung der Flederthiere, Tylonycteris. Hildebrand.—Über die Bestäubungs-verhältnisse bei den Gramineen.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.

Bulletin, Decembre, 1872.

Examen comparatif du tracé des routes proposées pour unir l'Europe et les Indes par le sud du Caucase.

Janvier, 1873.

Dr. Martin.—L'extrême Orient. Clermont Ganneau.—Découverte de la ville royale Chanan come de Gezer.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Proceedings, 30th June and 31st July, 1872, parts 1 and 2.

Mr. R. H. Tweddell.—On the application of water pressure to shop tools and Mechanical Engineering works. Mr. W. Proctor Baker.—On the Buchholz process of decorticating grain and making Semolina and flour by means of fluted metal rollers.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM.

A Manual of Diseases of the Eye, by Dr. C. Macuamara.

THE AUTHOR.

A Treatise on Asiatic Cholera, by Dr. C. Macnamara.

THE AUTHOR.

Kumara Sambhava, in Bengali rhymes, by Babu Ranga Lál Banerji.

Тие Аптнов.

Additional Notes on the Raptorial Birds of North Western India, by A. Anderson.

THE AUTHOR.

The Christian Spectator, Vol. II, Nos. 21 and 22.

THE EDITOR.

The Calcutta Journal of Medicine, Nos. 11 and 12.

THE EDITOR.

Professional Papers on Indian Engineering, Vol. II, No. 7.

H. Bell.—Graphic Time Table. P. Dejoux.—Margoni cement. C. Fouracres.—
Hydraulic Brake and Tumbler Shutters. Major A. M. Lang.—Eastern Ganges Canal.
Major H. Tulloch.—Masonry versus Earthen Dams. Capt. E. V. Twemlow.—Experiments on Selenitic Mortar.

THE EDITOR.

The Rámáyana, Vol. 3, No. 5.

THE EDITOR.

The Annals of Indian Administration, 1870-71, Vol. XV. part 2, and Vol. XVI, parts 1 and 2:—

Report on the Administration of the N. W. Provinces for 1871-72.— Annual Report on the Insane Asylums in Bengal in 1871.—

Report on the Excise Administration in the Lower Provinces for 1871-72.

Report on the Sanitary Administration of the Panjáb for 1871. Statistics of the Crime of Dacoity.

THE GOVERNMENT OF BENGAL.

General Report on the Topographical Surveys of India for 1871-72.

THE SURVEYOR GENERAL OF INDIA.

Results of a Tour in Dárdistán, &c. Vol. I., No. 111.

THE GOVERNMENT OF THE PANJÁB.

Purchase.

Pratnakanira Nandini, Vol. V, No. 8.

The Indian Antiquary, March, 1873.

Capt J. S. F. Mackeaue — The Kulwadi of the Hassan district. J. Beames,—On the Sub-Divisions of the Bráhman caste in Northern Orissa. Professor Ramkrishna Gopal Phandackae. — Patanjali's Mahabháshya. Kashinath Teimbak Telang. — The date of Sri Harsha. E. Rehalsek. — An Embassy to Khatá or China, A. D. 1419. Capt. R. Cole.—Cromlechs in Maisur

Exchange.

• Nature, Nos. 170-74.

Meteorological Observations.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of February 1873.

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East. Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet. Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	ight o nnete r aht.				· Bull ictor.		of the Telluring the	
Date	Mean H the Bar at 32° J	Max.	Min.	Diff.	Yean D Therm	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	0	0	0	o
1 2 3 4 5 6 7 8 9 10 11 2 13 14 15 16 17 18 19 20 12 13 14 15 16 17 18 19 12 10 12 1	29 994 30,036 .106 .012 20 972 .975 .982 .993 .972 .960 30,005 29 988 .976 .935 .945 .995 30,022 29,956	30 082 .114 .194 .112 .060 .065 .072 .018 .061 .039 102 .092 .067 .011 .011	30,049 20,965 .891 .916 .939 .953 .831 .927 .908 .945 .935 .911 .869 .890 .940	.145 .169 .169 .149 .118 .119 .134 .131 .137 .157 .157 .129 .156 .142 .121 .130	71 1 70 1 68 2 67 7 69 1 70 8 75.8 71.8 73.1 70.8 71.8 70.9 71.8 75.5 76.6	82.1 78.7 71.6 70.4 80.8 82.0 81.0 81.3 81.3 81.5 82.2 81.4 80.5 81.5 82.2 81.5 80.7 80.8	61.5 61 5 60 0 59.5 57.9 59.0 60.1 63.0 62.6 59.5 59.8 60.5 63.0 60.5 63.0	21 0 21 3 16 8 21.3 20.4 22.7 23.7 23.4 23.5 20.7 22.2
21 22	.853 .869	29.923 .958	.783 .810	.140	77.3 78.2	88.0 88.3	68.0 69.5	20.0 18 8
23 24	.805 .745	.883	.722 .686	.161 .121	79.7 79.3	90.6 91.3	73.3 69.0	$\begin{array}{c} 17.3 \\ 22.3 \end{array}$
25	.767	.846	.719	.127	80.6	92.5	72.0	20 5
26 27 28	.772 .761 .808	.852 .837 .901	.723 .697 .718	.129 .140 .186	80 1 81.3 77.6	92.4 93.5 86.7	71.7 73.0 69.0	20.7 20.5 17.7

The Mean Reight of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Meleorological Observations.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surreyor General's Office, Calculta, in the month of February 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

		act	A Hache		, -			
	Ther-	e Wet.	lew Point.	e Dew		pou air.	tio	un sat
Date	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dow Point.	Drv Bulb above Dew	Ŀ	LeanWe in a Cul		oul.
					Inches.	T. gr.	T. gr.	
21 22 23 24 25 26 27	63 4 65 65 66 65 8 4 66 65 9 66 66 66 66 66 66 66 66 66 66 66 66 6	8844 7.5843 6633 9987 1000 1007 6693 883 77.8 678.8 78.8 78.7	57 9 56 6 6 7 2 4 5 5 6 6 1 5 5 2 4 5 1 9 9 5 1 3 6 2 1 6 6 1 5 5 2 4 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5 6 6 1 5	13 5 11 4 15 1 11.5 13 5 11.5 11.5 11.5 11.5 11.5 17.5 18.0 17.5 11.2 13 4 14 1 15.1 14.1 2.4 5 0 10.2 2.2 2.1 2.1	0 488 .458 .422 .438 .431 .449 .509 .550 .607 .515 .405 .405 .401 .398 .412 .432 .565 .561 .552 .560 .582 .626 .666 .603 .736 .686 .655 .458	5 31 .03 4.66 .85 .75 .91 5.59 6.02 61 5.61 4.91 .42 .39 .53 .73 6.17 .11 .00 5 98 6 31 .77 7.19 6 52 7.94 4.04	3 01 .07 .03 2.27 .71 .59 .69 .765 .85 4 01 3.48 .59 .72 2 73 5.51 .79 .67 .453 .407 .4307 .4307 .540 .5507	0 64 .62 .61 .68 .63 .68 .69 .71 .56 .53 .56 .55 .56 .63 .63 .63 .64 .63 .64 .63 .64 .65 .65 .65 .65 .65 .65 .65 .65

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the mouth of February 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereog.

	Mean Height of the Barometer at 32° Faht.	for e	of the Ba ach hour the moutl	during	ry Bulb	ture	of the To for each ng the m	hour
Hour	Mean H the Barc	Max.	Min.	Diff.	Meaff Dry Bulb Thermometer.	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	•
Mid- night	29 935	 30 107	29 738	0 369	69.3	77.5	62 2	15.3
1,51	.927	.101	.729	.372	68 6	76.5	61.5	15.0
2	.918	(49),	.723	.367	67.8	75 6	60.5	15.1
3	.908			.360	67.2	75.0	60 0	150
4.	.907	.074	.723		66.5	71.7	59 5	15.2
5 6	.921		, .730	.351	65.8	74 2	59 0	15.2
6	.940	.102	.735		65.2		58.5	15 ()
7	.957	.125 .159	$.751 \\ .783$.374 .376	61.7 67.0	73.7 75 0	57 9 60 5	15.8 14.5
8	.981	.183	.801	.382	71.1	790	61.1	14.6
10	.015	.193	.807	.387	75.7	83 0	66.4	16.6
ii	.004	.182		.381	78.9	86.8	67.5	19.3
	•							
Noon.	29.975	.147	.770	.377	81.5	89.1	69.0	20 4
1	.944	.119	.737	.382	83 2	920	71.3	20 7
2	.913	.085	.708	.377 ,	814	93.2	73 3	19.9
3	.892	.067	.696	.371	85 ()	93 5	74.0	19-5
4	.881	.057	.686	.371	816	92 1	746	17.8
5	.881	.049	.686	.363	83 3	90.0	740	16.0
6	.890	.057	.688	.369	797	86.4	70 5 1 690	15.9
7 8	.902 .921	.076 .097	.714 .740	.362 .357	763 743	82 7 80. 1	67.0	13. 7 13. 4
9	.935	.107	.757	.350	72.4	79.0	65.5	13.4
10	.912	.110	.763	.317	71.3	78.5	64.0	14.5
iĭ	.987	.114	.747	.367	70.3	78.4	63.0	15.4
		•						

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourty Victoriological Observations taken at the Surreyor General's Office, Calcutta, in the month of February 1873.

Homly Means, &c of the Observations and of the Hygrometrical elements dependent thereon -(Continued).

Hour	Mean Wet Bulb Ther-	Dry Buil above Wet.	Computed Dew Point.	Dr. Bub above Dew	Mean Plactic force of	Mean Wught of Vanour	Additional Waski of Lapon required for consists attraction	Mound give of Humi- afty compare satura- tion bong unity.
		, o	o	o	Inches	T gr	T gr	
Mud- night 1 2 3 4 5 6 7 8 9 10	65 1 61 5 64 0 63 6 63 1 62 0 61 7 63 0 64 7 66 1 66 8	4 2 1 1 1 3 8 3 6 3 1 3 2 3 2 4 0 6 7 9 6 1 2 1	61 7 61 2 61 0 60 7 60 1 59 1 59 3 59 3 59 3 59 3	7 6 7 1 6 5 6 5 6 5 7 2 1 2 1 1 6 3 20 6	0 551 511 * 536 536 523 513 511 520 511 512 .191	6 00 5 98 89. 5 98 80 60 67 60 67 60 733	1 171 66 50 13 31 21 22 12 55 275 93 5 11	0 78 70 51 52 51 52 51
Noon 1 2 3 4 5 6 7 8 9 10 11	67 1 67 5 67 9 63 9 67 8 69 3 69 9 66 3 66 1 66 1 65 8	11 1 15 7 16 5 17 0 16 8 15 0 10 8 8 3 7 1 6 1 5 2 4 5	57 0 56 5 56 3 56 1 56 0 57 8 61 3 62 2 62 2 61 4 61 9 62 2	215 267 257 259 286 255 151 111 110 91 8.1	173 465 .162 .459 .159 .456 .516 .563 .518 .557 .503	08 1 95 90 89 5 20 90 6 11 .11 .60 .12 .19	6 23 91 7 37 63 51 6 73 4 82 3 59 CO 21 1.89	.15 .42 .10 .39 .39 .11 .55 .67 .70 .71

All the Hygrometrical elements are computed by the Greenwich Constants.

Meteorological Observations.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the mouth of February 1873.

Solar Radiation. Weather, &c.

_	3 1	21° 6	WIND.		
		Gua abc	10	11.0	E General aspect of the Sky.
۵i	Max radi	Rain 1, ft. Gr	Prevailing direction.	_	
	0	Inches	1	lb .	Miles
	134.0		NE&NW		760 B.
2	131.2		NW&NE	•••	98.2 B to 6 A. M. Li to 10 A. M., B to 11 P. M. Slightly foggy from
ا			N 73		8 to 10 r. m
3	130.8		NE	•••	126.5 B. to 2 P. M. \i to 6 P. M. B
4	125.0		NE&W by N		121.5 _i & \ito 1 A. M. B to 4 A.
				'	'm. \inito 9 a. m. S to 3 p. m. \inito 6 p. m. B to 11 p. m.
5	135.0		WNWWNW		60.2 B. Slightly foggy from 7 to 9
6	133.3		N W		44 t B. Slightly foggy at 7 & 8 A.
7	100.0		W&WNW		м. & 8 & 9 р. м.
	200			• •	31.5 B. Slightly foggy from 5 to 7
8	138.0		W N W&W by N		26.5 B. Slightly foggy at 5 & 6 A.
9	141.0		wsw&ssw		508 B to 2 p. m., "i 40 5 p. m. B
					to 11 r.m. Slightly foggy from 4
10	135.0		N & N by W		102.6 B. Slightly foggy from 8 to
11	139.0		NNE&NW		75.6 B. Slightly foggy at midnight
		•••			& 1 A. M., & from 8 to 10 P. M.
	136.5 138.7	•••	NNE&NE NE&NW	0.2	101.4 B Foggy from 8 to 11 P. M. 90.6 B Foggy from midnight to 6A.
				٥.2	M.
14	135.0		N W		B Slightly foggy at 9 & 10 P.
15	135.0		NW&ENE	٠٠.	102.0 B.
16	140.5		WNW&NNW		79.0 B. Slightly foggy at 8 p. m. 74.0 B to 3 p. m. i to 7 p. m. B
1/	142.5		W by S& SS W		to 11 P. M. Foggy from 5 to 9 A.
18	144.0	•	ssw		84.5 B to 8 A.M. i to 6 P.M. B to
- 1				•••	11 P. M. Foggy from 4 to 7 A.M.
19	142.0		WSW&NW		79.9 Chiofly \i.

[`]i Cirri,—i Strati, ^i Cumuli, Li Cirro-strati, ^i Cumulo-strati, ^i Nimbi, `i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of February 1873.

Solar Radiation, Weather, &c.

olar on.	Mix A	D.	
Date. Max. Solar radiation.	Wix Prevailing direction.	Max. Pressure Daily Velocity.	General aspect of the Sky
$egin{array}{c c} 0 & 0 \\ 20 & 141.5 \\ 21 & 142.8 \\ \end{array}$	Inche SSW W by S	lb Mile. 80.5 115.3	
22 141.0	w & s s w	56.8	B to 1 A. M. hi to 7 A. M. B to 11 P. M.
23 142.2	SSW&S	107.6	B to 2 A. M. i to 4 A. M. S to 9 A. M. B to 11 P. M. Foggy
24 145.0	W by N & W byS	119.2	at 6 A. M. B. Slightly foggy from 3 to 7
25 144.0	s	102.7	A, M. B to 4 A. M. S to 6 A. M. B to 2 P. M. Li to 4 P. M. B to 11 P.
26 145.0 27 141.5		0.8 183.5	B. B.
28 138.0	N by W& W by N	199.7	В.

i Cirri,—i Strati, ci Cumuli, Li Cirro-strati, Li Cumulo-strati, Li Nimbi, Li Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the mouth of February 1873.

MONTHLY RESULTS.

Constitution for the Constitution of the Const	
	Inches.
7. 1.1. 0.1 70 0.1	
	29 935
	30.194
Min. height of the Barometer occurred at 4 & 5 r. M. on the 24th	29.686
Extreme range of the Barometer during the month	0.508
	30.016
	29.872
7 7 7	0.144
Mean daily range of the Barometer during the month	0.134
	0
Mean Dry Bulb Thermometer for the month	73.9
Max. Temperature occurred at 3 r. m. on the 27th	93 5
Min. Temperature occurred at 7 A. M. on the 25th	57.9
Extreme range of the Temperature during the month	35.6
Mean of the daily Max. Temperature	85.1
Ditto ditto Min. ditto,	64.6
Mean daily range of the Temperature during the month	20.5
M. T. (1) 11 (D)	
Mean Wet Bulb Thermometer for the month	65.7
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer .	8.2
Computed Mean Dew-point for the month	6 0 0
Mean Dry Bulb Thermometer above computed mean Dew-point	13.9
	Inches.
Mean Elastic force of Vapour for the month	0.523
The second secon	0.020
	
Troy	grain.
Mean Weight of Vapour for the month	
Additional Weight of Vapour required for complete saturation	3.30
Mean degree of humidity for the month, complete saturation being unity	
Mean degree of numbary for the month, somplete saturation being unity	0.61
	0
Mean Max. Solar radiation Thermometer for the month	138.4
Mean Max. Solar radiation Thermometer for the month	190.4
•	
	uches.
	Nil
Rained No. day,—Max. fall of rain during 24 hours	Nil
Total amount of rain during the month	7411
	3711
meter during the month Prevailing direction of the Wind N. W. &	Nil
Prevailing direction of the Wind N. W. &	N.E.

^{*} Height 70 feet 10 inches above ground.

Abstract of the Besults of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Feb. 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour. when any particular wind was blowing, it rained.

S INC. ITIMAT	
M. by W.	
Main on.	
.W. W. W	1833 1 11113338
no ninst	
N. W.	
Rain on.	
W.W.W.	- 0101010101010101010
Rain on,	
W.by N.	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
Rain on.	
	03 03300
Rain on.	
W. by S.	4. 4 10 w 10 10 10 10 10 10 10 10 10 10 10 10 10
Rain on.	
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но півЯ	
s. W.	31 HELL HEA 61 22 4 HELL
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"W vd 8	
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N by E.	<u>4</u>
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Main on.	
N. by E.	HE 1981 H
Rain on.	
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Hour.	6 kg
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Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1873.

Latitude 22° 33′ 1" North. Longitude 88° 20′ 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent, thereon.

Range of the Barometer | Range of the Tempera-

		Max.	Min.	Diff.	E.3	Max.	Min.	Diff.
	T I				·	,		
	Inches.	Inches.	Inches.	Inches.	o	0		
1	29 873	29.959	29.830	0.129	71.8	86 4	618	21.6
2	.858	.937	.789	.119	75.7	86.5	66.0	20.5
3	.830	.885	.77 1	.111	78.4	88 3	70.7	17 6
4	.898	.990	.829	.161	77 0	86 5	68 5	18.0
5	.892	.972	.818	.151	733	88.0	71.0	170
6	.923	.998	.88.	.111	727		70.0	50
7	.891	30 027	.833	.191	719		68.0	165
8	.887	29.973	.928	.145	72.7		66.6.	14.4
9	.954	30.021	.891	.130	72.3	80.5	65 O	15.5
10	.951	.030	.880	.150	73 2		63.8	19 7
11	.910	.003	.829	.174	75.9		67.0	195
12	.856	29.931	.776	.155	79.1	90.7	69.3	21.4
13	.815	.889	.7 17	.142	80.4	89.8	73.0	16.8
14	.865	.956	.792	.164	77 k	83 8	73.0	10.8
15	.902	.979	.839	.140	77.9	89.0.	68.5	20.5
16	.908	.980	.859	.121	79.5	90 0	712	18 8
17	.908	.989	.835	.154	81.3	91.6	73.0	18 6
18	.884	.971	.816	.155	80 8	91.4	720	194
19	.823	.901	.711	.160 ;	81.6	93 5	728	20 7
20	.781	.819	.701	.149	82.8	95.0	74.5	20 5
21	.803	.878	.731	.1.17	83.1	917	75 5	19.2
22	.781	.853	.702	.151	816	97.8	750	22.8
23 24	.780	.813	.705 .731	.138	85.8	99 0	76.5	225
24 25	.798	.890	.756	.159	85.8	97 0	77.0	20.0
26 26	.822	.915		.159 .125	85 1	95 0	78.0	17.0
27 27	.785	.849	.721		817		77.6	17.9
28	.792 .819	.863 .884	.724 .763	.139 .121	83. I 83. I	93 0	77.0 76.0	15 2
29	.896	.068	.833	.1:15	82.1	92.4	76.0 77.0	17 0 15.4
30	.896	.974	.633 .822	.152	82.9	93.4	77.0 75.5	13.4 17.7
31	.865	.941	.770	.174	81.3			21.3
-					J			

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb. Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

			•					
Date	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Plastic force of vapour.	MeanWeight of Vapou in a Cubic root of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Hunn- dity, complete satu- ration being unity.
	0	0	0	0	Inches.	T. gr.	T. gr.	
1284456678910111122131441515161718192012222342256278893031	62.8 66.5 71.9 69.1 72.0 68.6 69.1 67.7 71.7 71.6 69.9 70.0 72.5 76.5 76.5 76.5 77.8 77.8 77.8 77.8	12 0 9.2 6.5 7.9 6.8 1 5.8 5.2 8.5 8.8 7.4 4 5.8 9.1 7.6 4 7.9 3 10.3 5.6 5.4 7.8 5.8 5.4 7.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5	54 4 60.1 67.3 63 6 67.3 65.0 65.0 65.0 60.9 60.9 60.5 62.8 62.1 62.4 66.1 69.2 69.8 67.9 73.5 72.2 69.6	20 4 15.6 11.1 13.1 11.6 7.4 9 9 15.3 15.0 12 6 9 9.9 15.1 16.3 19.2 18.4 15.5 10.9 14.8 15.5 17.5 9.9 11.8 17.5 9.9 11.8 17.5 9.9 11.8 11.8 11.8 11.8 11.8 11.8 11.8	0 134 .525 .666 .540 .661 .623 .617 .581 .488 .539 .715 .670 .574 .561 .727 .727 .727 .728 .706 .664 .824 .814 .717	4 72 5.70 7.21 6 40 7 17 6.83 .73 .86 7.00 .27 6.22 .28 .03 .10 .87 7.71 .74 .33 .53 .90 8.83 .73 .97 .77 .97 .97 .97 .97 .97 .97	4.5.1 3.81 .10 .49 1.85 2.55 .29 3.33 .49 .71 .53 2.74 3.91 4.38 4.97 .47 3.98 .50 4.68 5.00 .15 .33 3.13 .24 .55 .29 .50 .60 .60 .60 .60 .60 .60 .60 .6	0.51 .60 .70 .65 .69 .73 .74 .61 .67 .51 .55 .61 .62 .60 .57 .57 .57 .57 .57 .63 .63

All the Hygremetrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

eight of meter at Faht.	Range of the Barometer for each hour during the month.		ry Bulb ometer.	Range of the Tempera- ture for each hour during the month.			
Mean H the Bard	Max.	Min.	Diff.	Mean Dr Thermo	Max.	Min.	Diff.
Inches.	Inches.	Inches.	Inches.	0	0	0	•
		.749	.203	75 3 74.8 74.2 73.7 73.2 72.6 72.1 72.2 74.6 78.2* 81.4 84.3	81.0 81.0 80.8 80.5 80.3 80.0 79.0 78.0 80.5 84.1 88.0 91.8	67.6 66.8 66.0 65.5 65.0 64.0 63.8 63.9 67.5 68.4 72.0	13.4 14.2 14.8 15.0 15.3 16.0 15.2 14.1 13.0 15.7 16.0 17.8
.901 .867 .837 .814 .801 .798 .805 .818 .841 .860 .873	.001 29.970 .917 .936 .924 .916 .925 .940 .966 .987 .997	.802 .761 .736 .716 .701 .702 .723 .736 .767 .782 .805 .803	.202 .209 .211 .220 .223 .214 .202 .204 .199 .205 .192	86.6 88.1 89.1 89.6 89.5 87.9 81.8 79.7 78.3 77.0 76.1	94 5 96.6 98.0 99.0 98.0 93.0 87.5 85.3 81.0 82.4 82.0	74.8 73.7 73.0 73.5 74.2 75.0 74.5 73.6 72.8 71.3 70.0 68.9	19.7 22.9 25.0 25.5 24.8 23.0 18.5 12.5 12.7 12.4 13.1
	29.864 .853 .843 .835 .833 .850 .869 .916 .533 .937 .926 .901 .867 .837 .814 .801 .798 .805 .818 .841 .860 .873	Inches. Inches.	Inches. Inches. Inches. 29.864 29.931 29.794 .853 .975 .781 .843 .965 .768 .835 .952 .749 .850 .952 .762 .869 .968 .888 .980 .803 .916 .30.003 .827 .533 .023 .813 .937 .030 .812 .926 .022 .831 .901 .004 .802 .837 .947 .736 .814 .936 .716 .801 .924 .701 .798 .916 .702 .805 .925 .723 .818 .940 .736 .841 .966 .767 .860 .987 .782 .873 .997 .805	Inches. Inches. Inches. Inches. 29.864 29.991 29.791 0.190 .853 .975 .781 .194 .843 .965 .768 .197 .835 .952 .749 .203 .833 .941 .750 .191 .850 .952 .762 .190 .869 .968 .782 .186 .888 .980 .803 .177 .916 30.003 .827 .176 .933 .023 .813 .180 .926 .022 .831 .181 .926 .022 .831 .191 .901 .004 .802 .202 .837 .947 .736 .211 .814 .936 .716 .220 .801 .924 .701 .223 .798 .916 .702 .214 .805 .925 .723 .202	Inches. Inches. Inches. Inches. o 29.864 29.994 29.794 0.190 75.3 .853 .975 .781 .194 74.8 .843 .965 .768 .197 74.2 .835 .952 .749 .203 73.7 .833 .941 .750 .191 73.2 .869 .958 .762 .190 72.6 .869 .968 .782 .186 72.1 .888 .980 .803 .177 72.2 .916 30.003 .827 .176 74.6 .933 .023 .813 .180 78.2 .926 .022 .831 .191 84.3 .926 .022 .831 .191 84.3 901 .004 .807 .807 .761 .209 88.1 .811 .898 .940 .762 .214 .879 .895 .925 .723 .202 84.9 .895 .798 .916 .702 .214 .879 .805 .925 <	Inches. Inches. Inches. Inches. o o 29.864 29.994 29.794 0.190 75.3 81.0 .853 .975 .781 .194 74.8 81.0 .843 .965 .768 .197 74.2 80.8 .835 .952 .749 .293 73.7 80.5 .833 .941 .750 .191 73.2 80.3 .850 .952 .762 .190 72.6 80.0 .869 .968 .762 .186 72.1 79.0 .888 .980 .803 .177 72.2 78.0 .916 30.003 .827 .176 74.6 80.5 .937 .030 .812 .188 81.4 88.0 .926 .022 .831 .191 84.3 91.8 .901 .004 .802 .202 86.6 94.5 .867 29.970 <t< th=""><th>Inches. Inches. Inches. Inches. o o 29.864 29.984 29.794 0.190 75.3 81.0 67.6 .853 .975 .781 .194 74.8 81.0 66.8 .843 .965 .768 .197 74.2 80.8 66.0 .835 .952 .749 .203 73.7 80.5 65.5 .833 .941 .750 .191 73.2 80.3 65.0 .869 .968 .762 .190 72.6 80.0 64.0 .869 .968 .782 .186 72.1 79.0 63.8 .888 .980 .803 .177 72.2 78.0 63.9 .916 30.003 .827 .176 74.6 80.5 67.5 .533 .023 .813 .180 78.2* 84.1 68.4 .937 .030 .842 .188 81.4 88.0</th></t<>	Inches. Inches. Inches. Inches. o o 29.864 29.984 29.794 0.190 75.3 81.0 67.6 .853 .975 .781 .194 74.8 81.0 66.8 .843 .965 .768 .197 74.2 80.8 66.0 .835 .952 .749 .203 73.7 80.5 65.5 .833 .941 .750 .191 73.2 80.3 65.0 .869 .968 .762 .190 72.6 80.0 64.0 .869 .968 .782 .186 72.1 79.0 63.8 .888 .980 .803 .177 72.2 78.0 63.9 .916 30.003 .827 .176 74.6 80.5 67.5 .533 .023 .813 .180 78.2* 84.1 68.4 .937 .030 .842 .188 81.4 88.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb a Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hunrly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of March 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

All thelfygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of March 1873.

Solar Radiation, Weather. &c.

	Solar tion.	age ove	Wind.			
Date.	Max. Solaradiation	Rain Guage 113 ft. above Ground.	Prevailing direction.	Max. Pressure	Daily Velocity.	General aspect of the Sky.
1 3	0 139.5 140.5 142.5	Inches	Variable. N N W & S S	Ib	Miles 75.6 56 5 122.8	B. B.
4	139.5		S & S E	08	216.8	B to 3 A. M., Li to 2 P. M.,
5	141.3 —	0.02	S by E & S Variable.	0.5	159.6	Clouds of different kinds, S. to 5 A M. O to 7 P. M., Li to 9 P. M., it to 11 P. M. Slight- ly foggy at 11 P. M. Light R.
	137.5	0.10	S & Variable.		96.2	between 6 & 7, at 12 a. m., 2 & 5 ³ P. M. Clouds of different kinds. Tat 8 ¹ a. M. Light R between 3 & 4 & at 9 a. M.
	138.2	1.06	Variable.	6.0	138.1	S to A. M. O to 9 A. M., hi & i to 7 P. M. B to 11 P. M. High wind between 12 & 2 A. M. Slightly foggy from 8 to 10 P. M. Lightning from midnight to 2 A. M. B from 22 to 7 A. M.
	136.5		W, N W & N by E		109.4	В.
	138.0 139.0	}	ESE, Eby N& E&NW		116.0 75.5	B. B to 11 A. M., it to 3 P. M. B to 11 P. M. Slightly feggy from, 5 to 7 A. M.
	145.0		S by W		120.9	B. Slightly foggy at 6 A. M.
13	144.0		S S W		148.8	B to 11 A. M., \i & \ai to 2 P. M. B to 4 P. M., \ai to 11 P. M.
14	139.4		SSW&NW	2.8	134.9	B to 5 a. M., \ini to 10 a. m. O to 8 P M., \ini to 11 P m. Brisk
15	142.0		S&SSW		146.1	wind at 2½ P M. D at 3½ P M. i to 4 A M. B to 8 A M.
16	1 44 .0		Variable.	ı	91.2	to 11 рм. О to 6 дм. \i to 10 дж. В to 6 рм. \i to 11 рм.

\i Cirri,—i Strati, ^i Cumuli, —i Cirro-strati, ^ i Cumulo-strati, \inc i Nimib, \inc i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, B rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of March 1873.

Solar Radiation, Weather, &c.

	Solar tion.	STELL WIND.	
Date.	Max. Solaradiation.	Wind. Grandler Grand	Δ
17	142.5	S by E & E	94.4 \int to 4 A M. \int to 7 A M. \int to 2 P M. \int to 6 P M. B to 11
	142.0 141.0	8,88 W&WNW 8 W & 8	104.8 В. 135.1 В to 3 рмi to 5 рм. В
	140.2		to 11 PM. 1 246.8 B to 1 PM. i to 4 PM. B
22	141.8 145.0	SSE&SSW 0.	2 115.2 B.
24	143.0 144.5 141.5	S, S W & N W 0. W S W & S by W Variable.	165 5 B. Foggy at 6 & 7 A. M. 122.3 S to 6 A. M. B to 11 P. M.
26 27	140.0 1 37 .0	S&S by E 0.3	137.8 B. 2 191.7 B.
	139.0 139.0	S by E & S	216.7 B to 6 A. M. S to 10 A. M. B to 180.2 B to 4 A. M. S to 8 A. M. B to
i	138.8	S by E & S by W	173.1 B to 11 A. M., clouds of different kinds to 8 P. M. B to 11 P. M. Foggy from 5 to 7 A. M.
31	142.7	S by E & S	224.7 B.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of March 1873.

MONTHLY RESULTS.

		Tl
		Inches.
Mean height of the Barometer for the month		29.860
Max. height of the Barometer occurred at 10 A. M. on the		30.030
Min. height of the Barometer occurred at 4 P. M. on the	20th	2 9.701
Extreme range of the Barometer during the month		0.329
Mean of the daily Max. Pressures		29 939
Ditto ditto Min. ditto		29.792
Mean daily range of the Barometer during the month	•••	
Fried them.		
3.6 To To 11 M1		0
Mean Dry Bulb Thermometer for the month	•••	79.8
Max. Temperature occurred at 3 & 4 P. M. on the 23rd	•••	99.0
Min. Temperature occurred at 6 A. M, on the 10th	•••	63.8
Extreme range of the Temperature during the month		35.2
Mean of the daily Max. Temperature		90.0
Ditto ditto Min. ditto,		71.9
Mean daily range of the Temperature during the month		18.1

Mean Wet Bulb Thermometer for the month		71.0
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer abov	•••	
Commutal Many Day asiat Court and the court	nometer	80
Computed Mean Dew-point for the month		66.2
Mean Dry Bulb Thermometer above computed mean Dew-	point	13.6
•	•	Inches.
Wasse Wheat's Comes of Wassess Court I amount	•	
Mean Elastic force of Vapour for the month	•••	0.642
	Trov	grain.
Mean Weight of Vapour for the month		6.92
Additional Weight of Vapour required for complete satura		3.83
Mean degree of humidity for the month, complete saturation	ttion	0.64
mean degree of maniately for one monon, complete saturation	being antry	0.04
		0
Mean Max. Solar radiation Thermometer for the month		140.8
•	••••	
	•	
	1	nches.
	•• •••	1.06
Total amount of rain during the month		1.18
Total amount of rain indicated by the Gauge* attached to the	ue anemo-	
meter during the month		0.98
Prevailing direction of the Wind	8. & 8.	by E.
·	•	-

^{*}Height 70 feet 10 inches above ground.

Abstract of the Becults of the Hourly Medeorological Observations taken at the S. G. O. Calcutta, in the month of March 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour. when any particular wind was blowing, it rained.

Rain on. 1	
N. by W.	
Ino minst	
Sam on.	
40 11118	
_ 'W .X	
Ram on.	
11.2.11.	
Rain on.	
W by Y.	
Rain on.	
	000 H H H H H H H H H H H H H H H H H
Rain on.	
W by 8	9 0H _ H H H H H H H H H H H H H H H
Ro tinst	
11.8.11.	of Edgeddeesides 4 [Februari Fee]
no men	
$-\frac{n}{s}$	2000 014 2F 4 401014 . CC 20
Rain on.	
W.S.8.	च च्याघणण्य च व्याष्ट्रम् च व्याप्ता च व्यवस्थात् च व्याप्ता
Rian on.	
S. by W.	ci_ co 24 - 221 21 - 1 2 ci 10 ci ci ci 20 co
Rain on.	
- "	8 8 8 8 8 8 7 8 7 8 7 8 8 8 8 8 8 8 8 8
Rain on.	
3 44 S	# D + 104 + + 10 5 L - 1
no ninsi	·
3. 8. B.	2 a s a z a z z
no ninst	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
3 B	
Main on.	
E S E	
Rain on.	
E pa S	
no mail	
	ରାଜାତା ଗାଡ ଗାଳ ଲ
Hain on.	
Kain on.	
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Rain on.	
A. N. K.	H
Ro ninst	01-
N. by E.	pel
Rain on.	
N_	
Hour.	Mid night 11 Noon. Noon. 11 11 11 11 11 11 11 11 11
10.1	

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR MAY, 1873.

A meeting of the Asiatic Society of Bengal was held on Wednesday, the 7th instant, at 9 P. M.

Col. Hyde, R. E., President, in the Chair.

The minutes of the last meeting were read and confirmed.

The following presentations, received since the last meeting, were laid on the table—

- 1. From the Government of India, Home Department; a copy of a photograph, taken by J. H. Ravenshaw, Esq., C. S., of a pillar dug up at Bannagar in Dínájpúr.
- From Sirdár Attar Singh Bahádur, Chief of Bhadaur, one silver and several copper coins.

Mr. Blochmann said that the copper coins were all known and published, and belonged to the reigns of Mu'izz, Balban, and Muhammad Tughluq. One was a brass token of the forced currency of the last king. The silver coin was modern, but too much was cut away to allow of a reading.

From the Government of India, Home Department, a set of 11 photographs of views of Sunnárgáon, taken by Mr. Brennand, Principal of the Dacca College.

Mr. Blochmann said that the members would be disappointed if they expected to find among the remains of Sunnárgáon large and old buildings. The ruins are few, and belong to the 14th and 15th centuries, just as the inscriptions found there belonged to the same time. Dr. Wise, in a letter to him, remarked that the people there knew nothing of the importance of this old town; not a single legend was known now-a-days. The splendour of the Nawábí period; the encroachment of the river; and the fact that towns in southern Bengal are collections of mud houses rather than what we understand by towns, go far to explain this fact. Though, like Sátgáon, the seat of Muhammad governors and usurping kings, it is probable that neither town ever covered an extensive site.

Telkrishna Public Library.

The following gentlemen duly proposed and seconded at the last meeting were balloted for and elected Ordinary Members—

G. R. C. Williams, Esq., C. S.

H. B. Urmston, Esq., H. M.'s 1-14th Regt.

W. Mackay, Esq., C. E.

The Rev. John Hector, M. A.

The following is a candidate for ballot at the next meeting-

J. W. Johnston, Esq., M. D., 4th Regt. P. I., Abbotabad, proposed by Captain J. Waterhouse, seconded by H. Blochmann, Esq., M. A.

The Council reported that on the recommendation of the Philological Committee they will print in their Bibliotheca Indica, Captain Graham's English translation of Badáoní.

Col. Hyde exhibited electrotypes of 200 Greek coins from the British Museum.

Mr. Blochmann exhibited the following Arabic and Persian inscriptions received from members of the Society.

1. From Mr. J. G. Delmerick, Dihli, tracings of the following inscriptions from Sonpat. Mr. Blochmann reads and translates them as follows—

1. The Sonpat Mosque.—Balban's reign.

تجدد هذا العبارة المسجد المبارك الجامع فى نوبة السلطان الاعظم ظل الله فى المعالم غياث الدنيا و الدين القائم بامر الرحمن ابوالمظفر بلبن السلطان نامر امير المؤمنين خادالله ملكه و سلطانه العبد الضعيف ميربيك بن احمد بيك مقطع سونيت فى التاريخ رمضان المبارك عظم الله حرمته سنه سبعين و ستماية اا

This building, the blessed Jámi 'Mosque, was renewed during the reign of the great King, the shadow of God on earth, Ghiyásuddunyá waddín, who stands by God's order, Abul Muzaffar Balban, the King, the aider of the Commander of the Faithful—may God perpetuate his kingdom!—by the weak slave Mír Beg, son of Ahmad Beg, the muqti' (Jágírholder) of Sonpat. Dated, the auspicious month of Ramazán (may God increase its honor!), 670.

The name of the founder is not quite certain, as the discritical marks are wanting; it may be Mír Lang instead of Mír Beg; but the name of Ahmad Beg is clear. The letters of the inscription are thick and clumsy.

2. The Khwa'jah Khizr Kha'n Darga'h, of Sonpat.

مرتب شد عمارت دهليز حظيرة ميان خواجه خضر بن دريا خان شيرواني رحمة الله عيابها يوم الاثنين الخامس عشرصن شهر شوال سنة ثمان عشرين و تسعماية في عهد السلطان العادل الباذل الواثق بتأثيد الرحمن ابوالمظفر ابراهيم شاه بن سكندر شاه بن بهلول سلطان خلد ملكه و سلطانه ١١

The portice of the temb of Khwájah Khizr Khán, son of Daryá Khán Shirwání—may God have mercy upon both !—was erected on Monday, 15th Shawwál, 928, in the reign of the just and liberal King, who relies on the assistance of the Merciful, Abul Muzaffar Ibráhím Sháh, son of Sikandar Sháh, son of Buhlúl, the King. May God continue his kingdom and reign!

بعون الله تبارك و تعالى و فضلة عبارت گنبذ ابن حظيرة بندگي ميان معظم و مكرم ميان خواجة خضر مرحوم مغفور بن دريا خان بن شيخ المشايخ شيخ احمد بن ملک المشايخ شيخ مندوكي درويش شيرواني عليهم الرحمة و الغفران مقطع قصبة سونيته در عهد حضرت سلطان السلاطين معهد قواعد الاسلام و الدين ظلاالله في العالمين الواثق بتائيد الرحمن ابوالمظفر ابراهيم شاه بن سكندر شاه بن بهلول شاه سلطان خلد ملكه و سلطانة تهام شد بفرمايش لنكرخان خضر در پانزدهم ماه رجب وجب قدره سنة ثلثون و تسعماية اا

With the help of God, who is blessed and exalted, and by His grace, the building of this tomb of the great and noble saint, Miyán Khwájah Khizr Khán, the deceased, the pardoned, son of Daryá Khán, son of the Shaikh of Shaikh Shaikh Ahmad, son of the king of Shaikhs Shaikh Mandákí Darwísh Shírwání—may God have mercy upon them,—zamíndar of the town of Sonpat'h, was completed in the time of the king of kings, the confirmer of the laws of Islám and the faith, the shadow of God in both worlds, who trusts to the aid of the Merciful, Abul Muzaffar Ibráhím Sháh, son of Sikandar Sháh, son of Buhlál Sháh, the King—may God perpetuate his kingdom and rule!—by order of Langar Khán Khizr, on the 15th Rajab—may the honor of this month increase,—A. H. 930.

Regarding these three inscriptions, Mr. Delmerick has the following note:

'The first inscription is of the time of Ghiyasuddin Balban and bears the date Rajab, A. H. 670, or A. D. February, 1272. There is only one other inscription of the time of this monarch extant, as far as I know, viz., that on the walls of the Jami' Masjid at Garhmukhtesar in the Mirat District, and noticed by Thomas in his book on the Chronicles of the Pathan Kings of Dilhi, page 136.

'The inscription now for the first time published, is on the walls of the Masjid of Sayyid Naçı́ruddı́n 'Æbidullah at Sonpat.

'Local tradition states that Sayyid Naçırıddin 'Abidullah bin Ahmad, who was usually called Abbá Muhammad Naçır, came from Arabia viâ Egypt to Nıshapur, where hearing that the Rajah of Kanauj gave large prices for Turki horses, he bought a number of such horses and resolved to take them himself to India for sale. He had sixty servants with him. On reaching Sonpat, Rajah Arjun Deo, who was the Governor of the District, prohibited the Sayyid from proceeding further, and wanted to get the horses by force. There was a fight and the Sayyid together with fifty-nine of his followers suffered martyrdom. Arjun Deo himself and many other Hindús were slain in this contest. One man alone of the Sayyid's party escaped. His name was Jauhar. He was protected by, and found an asylum with, Sheo Chand, a Brahman,

whose descendants are still residents of the town, and are the hereditary Qanungos of the parganah.

'The date of the death of the Sayyid or horse merchant is said to be the 12th of Muharram, A. H. 287, or A. D. 19th January, 900.

'The second inscription is over the doorway of the building which covers the tomb of Khwajah Khizr Khan, and is dated the 11th Rajab, A. H. 930, or A. D. 16th May 1523. It is a beautiful edifice solidly constructed of sandstone, and in tolerably good preservation. The dome is lofty and grand.

'I have been unable to ascertain what particular office or rank this Khwájah Khizr, the son of Daryá Khán Shirwání, held at the time of his death.

'There was a celebrated chief of that period called Daryá Khán Lodi, who lived up to the time of Bábar's conquest of Hindústán; for he it was, as is commonly asserted by Muhammadan Historians, who invited Bábar to invade his master's dominions.

'Firishtah relates that "one day while the King (Sikandar Lodí) and his court were playing at chaugán, the bat of Haibat Khán Shirwání* by accident came in contact with the head of Sulaimán, the son of Daryá Khán "Lodí, who received a severe blow. This was resented on the spot by Khizr Khán, the brother of Sulaimán, who galloping up to Haibat Khán struck him violently on the skull. In a few minutes both sides joined in the quarrel, and the field was in uproar and confusion. Muhammad Khán Lodí and KhánKhánán Lodí interposing endeavoured to pacify Haibat Khán, and succeeded in persuading him to go quietly home with them."

"The king apprehensive of conspiracy retired immediately to the palace, but nothing more transpiring he made another party at the same game a few days after. On the road to the playground Shams Khán, a a relative of Haibat Khán Shirwání, perceiving Khizr Khán, the brother of Sulaimán Lodí, instantly attacked him with his bat and knocked him off his horse. The king abused Shams Khán grossly, and returned to his palace, and could not be persuaded but that there was some plot in agitation."

'In the above account, if we read Haibat Khán Lodí for Shirwání, Daryá Khán Shirwání for Lodi, and Sulaimán Shirwání for Lodi, we shall find that a Lodí struck a Shirwání, upon which the brother of the Shirwání assaulted the Lodí. The quarrel was made up for the time by other Lodís persuading their kinsman to go quietly home with them. As the narrative at present stands, if we follow Firishtah strictly to the letter, we are perplexed in think-

[•] In the Táríkh-i-Dáúdí, (vide page 463 of Elliot's Muhammadan Historians of India, Vol. IV) it is said that the bat of Dariá Khán Shirwání struck Sulaimán, but this is manifestly an error, and shows that a confusion of titles and even names is not by any means uncommon with Indian writers or copyists.

ing how the Lodís could have pacified a Shirwání so soon after the quarrel, and how they should have taken him to their home, which was not the home of the offended Shirwání. I am inclined, therefore, to correct the text of Firishtah to the extent above suggested, as I believe the same to be an error. Thus I almost certainly identify Khwájah Khizr Khán Shirwání of the inscription with the Khizr Khán who took so prominent a part in the scuffle above described.

'It is also stated by Firishtah that Khizr Khán was present during the successful operations against Chanderí, which took place during the latter part of the reign of Sikandar Lodí.

Another interesting inscription received from Mr. J. G. Delmerick, is the following, from the tomb of the renowned saint Bú 'Alí Qalandar, Pánípat. Mr. Delmerick says that the building has pillars of *kasáoti*, or touchstone, to which allusion is made in the inscription; but there are no other inscriptions at Pánípat.

Bú 'Alí Qalandar died at Pánípat on the 13th Ramazán, 724, or September, 1324; vide Proceedings, As. Society, Bengal, for April, 1870, p. 125.

Pa'ni'pat Inscription.

مظهر نور جلال است و جمال همچو عیسی مرده را بخشه روان از مقرب خان است افلاطون دهر خان بن خان است رزق الله خان برعلي چون بوعلي شیناس کرد زان شرف گشته ارسطوي زمان تا بنا فرعود ایران چو خلد هرستون سنگ محت در زیر آن از خرد جستم عیار سال او چون طلای کیمیا کردم عیان سال تاریخ بنایش در حساب شد بوالا جالا رزق الله خان

- 1. This tomb is the place where the light of God's glory and perfection appears; like Jesus, it gives life to the dead.
- 2. Muqarrab Khán, the Pluto of his age, had a son Rizqullah Khán.
- 3. When Bú 'Alí [the Pánípat Saint] recognized this Bú 'Alí [i. e. this great doctor], he [Rizqullah], thus honored, became the Aristotles of his age.
- He then ordered the erection of this paradisine portice, below which each pillar is made of touchstone.
- I put thought to the touch, in order to discover the year of the building, when
 I beheld the gold of alchemy,
- And the year of its erection appeared in the value of the letters ' the noble Rizquilah Khán' [1071, A. H., or A. D. 1660].

Regarding Muqarrab Khán and his son Rizqullah Khan, vide my Kín translation, pp. 544, 545. Rizqullah died in the 10th year of Aurangzíb's reign. The Maásir-ul-Umará states that the Dargáh itself was built by Muqarrab Khán.

2. From Ganga Parshád, Esq., Deputy Collector, Murádábád, several readings of inscriptions from Sambhal, Amrohah, and Murádábád, N. W. P. The translations are by Mr. Blochmann.

1. Ba'bar's Mosque at Sambhal.

This mosque, according to Mr. Ganga Parshad, "is situated in Mahallah Kot, and faces east. It was originally a Hari Mandir, and was converted into a mosque by Bábar's order. At the side is a tank for ablutions, and a very old well. The mosque has still a chain for the suspension of a bell, and a passage at the back for the wheeling round of worshippers. There are many inscriptions on stone tablets in this mosque shewing the dates of erection and repairs." The oldest is the following (metre, short Ramal)—

جامع ابنیهٔ فضل و کهال به رافع الویهٔ ملک و ملل

باسط اجمعهٔ اصن و امان به بانی ابنیهٔ علم و عمل

شاه جم جاه محمد بابر به جفظ الله له عز و جل

شمع دولت چو رافروخت به هند و روش از پرتو آن شدسنبهل

از پیع ساختن این مسجد به که مصون باد زنقصان وخلل

کردفرمان به کمین بندهٔ خویش به که بود عمدهٔ ارکان دول

میر با عقل و خرد هده و بیگ به آن به اخلاق نکو گشت مثل

چون ز فرمان شهنشاه جهان به یافت اتبام به ترفیق ازل

سال تاریخ و مه و روزش گشت به یکم از شهر ربیع الاول

سند سمه هجری

- 1. The collector of buildings of grace and beauty, the raisor of the standards of rule and of faith,
- 2. The spreader of the wings of peace and tranquillity, the builder of the buildings of knowledge and deed,
- 3. Muhammad Bábar, a Jam in dignity,—may God Almighty have him in His keeping!—
 - 4. Kindled in India the lamp of power, when a ray of it fell upon Sambhal.
- 5. To build this mosque—may it be protected against destruction and decay!-
 - 6. He gave orders to his mean slave, who is one of his principal officers,
- Mír Hindú Beg, the intelligent and wise, who is an example to others in polite manners.
- And when in consequence of the order of the sovereign of the world, by the guidance of Providence, the mosque was completed,
- 9. Its date was "the first day of the month of Rabi' I." (A. H. 933, or, 6th December, 1526, A. D.).

This mosque was repaired in A. H. 1067 (A. D. 1656-57) by Rustam Khan Dak'hini, as stated in the following Tarikh—

كرد ترين مسجد جامع مخان رستم خطاب نيك نهاد سال تاريخ اسعدي بغرشت م رونق خانة الهي داد

- The Jámi' mosque was adorned by the excellent Khán, whose title is Rustam Khán:
- The poet As'adí wrote down as Táríkh the words 'He adorned God's house.'
 (A. H. 1067.)

Two other tablets mention the *Táríkhs*—(1) buq'ah i faiz; and (2) Sijdahgahé khalq kardah.

2. The Mura'da'ba'd Mosque.

Murádábád is the old Chauplah or Chaupalah, so called from including in its boundary four villages, viz., Bhadaurá, Dindárpúrah, Mánpúr, and Dihrí. Rustam Khán Dak'hiní called it Murádábád in honor of Prince Murádbakhsh, Sháhjahán's son. The Jámi' mosque, on the right bank of the Rámgangá, stands on a high mound close to the bank, and has the following inscription—

نه بودلا در مواد آباد مسجد ، که بد بس کافرو هندو درانجا شه عادل شهاب الدین غازی * به رستم خان عطا فرمود آنرا بنا فرمود عالمي قدر خانع ، در الجا مسجد ، وعنا و زیبا بناء دین خود را کرد محکم ، به دنیا دین خود را کرد بالا پیم تاریخ او هر نکته دانے * شده در بحر فکر از طبع رعنا زدانایان یک زن بحر معنی * برون آورد لولوئے مصفا درخشنده در اینست بشنو * زاحواري نه از خضرو مسیحا درخشنده در الطاف الهی * بناي خانهٔ دین کرده بالا سنه رستم خان ز الطاف الهی * بناي خانهٔ دین کرده بالا سنه ۱۹۰۱ هجري

- 1. There was no mosque in Murádábád, where only Infidels and Hindús lived;
- The just king Shiháb-uddín Ghází (Sháhjahán) gave it, therefore, to Rustam Khán,
- 3. And ordered this excellent officer to build in the town a pretty and graceful mosque.
- 4. Thus he firmly established the building of his religion, and elevated, in this world, his faith.
- 5. Many a clever writer, in order to find a tarkh, dived ingeniously into the ocean of thought,
 - 6. And one of the wise, thus diving, brought up a pure pearl.
- The lustrous pearl is this, now listen,—it belongs to (the poet) Ahrárí, not to the prophet Elias and the Messiah,—
- 8. 'Rustam Khán, by God's grace, reared the building of the house of faith.'
 (A. H. 1046, or 1636, A. D.)

Mr. Blochmann said :--

The builder of the mosque, R u s t a m K h á n D a k 'h i n i, is frequently mentioned in the histories of Sháhjahán's reign. The *Maásir ul Umará* also has a biographical note, from which I extract the following:

Rustam Khán was a Chirgiz from Mount Elburz. He was sold as a slave, and came into the possession of the Nizám ul mulk of the Dak'hin.

His master, however, promoted him, made him an Amír, and gave him the title of Muqurrab Khán. He fought with his master against Sháhjahán (3rd vear of his reign). When the Nizam ul mulk imprisoned Fath Khan, (son of the renowed Malik 'Ambar) who had been Vakil and Commander-in-Chief. Mugarrab Khán received the command of the army, and Hamíd Khán Habshi was made Vakil. A short time after, Fath Khán was released and restored to his office. Muqarrab Khan was, therefore, deposed; and annoyed at this treatment, he fled to A'zam Khán, one of Sháhjahán's officers, for protection, and solicited an appointment of the emperor. Shahjahan received him favorably, gave him presents and a lak'h of rupees, and appointed him a commander of Five Thousand. Sometime after, in the fifth year of his reign, the emperor gave him Sambhal as tuyúl, and, in the 18th year, the title of Rustam Khán. He then accompanied Prince Aurangzíb on his expedition against Jhujhar Singh Bundela, and in the 10th year, he devastated, with Sayyid Khán Jahán Bárha, the country of 'Adil Sháh, and was then allowed to go again to his jágír. In the 15th year, he operated with Prince Murádbakhsh against Jagat Singh of Mau, and accompanied Dárá Shikoh to Qandahar. In the 19th year, he was ordered to accompany the army to Balkh, but to stay during the winter in Rohtás; and when the emperor returned from Kashmir, Rustam Khan accompanied Prince Muradbakhsh, whose left wing he commanded. After the conquest of Balkh, the Prince did not wish to stay any longer with the army, and the emperor sent Sa'dullah Khán to Balkh. He sent Rustam Khán to occupy Andkhúd and environs, and Rustam Khán defeated the Uzbaks in several smart engagements. When Aurangzib, after his arrival in Balkh, left the country to Nazr Muhammad Khán, Rustam Khán returned to his jágír in India. In the 21st year, he was present at the royal feast in the (new built) palace of Sháhiahánábád. Soon after, he was sent to Kábul. In the 22nd year, on the rumour of a march of the Persians upon Qandahár, Aurangzib was sent there, and Rustam Khan commanded the rear; but a short time after arrival before Qandahár, he was sent to Bust, where he defeated the Persians. and took eleven guns with material. Shahjahan gave him the title of Firuziang, and made him, on his return, a commander of Six Thousand, with 5000 horse. In the 25th year, he was again with Aurangzib before Qandahár. and again occupied, in the 27th year, the town of Bust, under Dárá Shikoh. But not long after, the siege of Qandahar had to be raised, and Rustam Khán returned. In the 28th year, he marched with Sa'dullah against Chitor. In the following year, by Dárá's order, he was sent to Kabul, from where he was recalled in the 31st year, when the war for the succession had broken out. Rustam Khán attached himself to Dárá Shikoh. and commanded, with Prince Sipihr Shikoh, the left wing in the battle of Samogar, near Agrah, in which Aurangzib defeated Dárá. He was wounded. and died soon after of his wounds (1068).

3. The Mosque of Amrohah.

The following inscription is on the Jámi' mosque of the old town of Amrohah. The town is rarely mentioned during the Mughul period; but its families of Sayyids were renowned, like those of Mánikpúr, Bilgrám, and Bárha. To them belonged the builder of the mosque, Sayyid Muhammad, of Amrohah, who held the post of Mír 'Adl, or Chief Justice, in the first half of Akbar's reign; vide my Kín translation, pp. 438, 490, where his biography will be found.

The inscription is (Metre, Mujtass).

به عهد اكبر غازي جالاًل دُولت و دين مدار ملك و ملل پادشاه ظل اله اله زمانه خادم درگاه اوست به تكليف ستاره بنده فرمان اوست به اكراه بنا نمود در امروهه مسجد جامع معز دين محمد امير خلق پناه سپهر مرتبه سيد محمد عادل كه وصف ار شده ارزاد خلق به گه و گاه مگو ز هاى اخير و بگوي تاريخش مئير و بگوي تاريخش بناي مير عدالت پناه عاليجاه

- In the reign of Akbar, the victorious, the glory (jalál) of power and religion
 the pivot of the kingdom and of the faith, the Pádishah, the shadow of God,—
- 2. (Time, without exaggeration, is the servant of his throne; the stars, without hesitation, are his obedient servants),—
- 3. The Jámi' mosque at Amrohah, was built by the ornament of Muhammad's religion, the nobleman with whom people take refuge,
- 4. Of exalted dignity, Sayyid Muhammad, the just, to whose praise people at all times sing homilies.
- 5. Leave out the final he, and you will find the date in the words, 'the building of the exalted Chief Justice.' (i. c. 996-16, =- A. H. 980, or A. D. 1572.)

The Fort of Amrohah.

The following inscription belonged to the Fort of Sayyid 'Abdul Majíd, alias Díwán, at Amrohah. The fort no longer exists; only a portion of the wall and gate is preserved.

الله اكبو

در عهد سلطان عالیشان صاحبقران ثانی شهاپالدین صحید شاهچهان پادشاه فازی خلدالله ملکه سیادت مآب میران سیده همدان این قلعه بنانمود ه شد چواین قلعه خورمی افزاه خوب مضبوط و خاص مستمکم خواستم سالش از دبیر خرد ه گفت بشمار قلعهٔ خورم سده ۱۰۰۱ هجری باهتمام بنده کملل خان خانهزاد شهر رمضان الببارات سنه ۱۰۰۱ هجری

God is Great!

In the time of the great king, the second Lord of Conjunction, Shihab uddin Muhammad Shahjahan Padishahi Ghazi—may God perpetuate his reign!—this fort was built by the refuge of Sayyids, Miran Sayyid Hamadan.

- 1. When this joy-increasing fort, beautiful, firm, and exceedingly strong, was built.
- 2. I took counsel with Thought and asked for a táríkh, when he said, "Count the letters in the 'happy fort'." (A. H. 1051).

Built by the servant Kamál Khán 'Khánahzád, in the blessed month of Ramazán, 1051. (December, 1641.)

The names of the builder and the architect do not occur in the Pádisháhnámah.

Mr. J. G. Delmerick has also sent to the Society readings of the following Sanskrit Inscriptions, which have been translated by Bábu Rájendralála Mitra.

1. S'arabala Inscription, Hariya'na' District.

- Salutation to that Ganádhi pati (a) by adoring whose feet mankind obtain all that they can wish.
- 2. May Satyala (b) with (his wives) Ambávatí and Ambá, preserve you,—the god by whose grace worshippers become objects of happiness.
- 3. There is a country named Hariyána, which is like unto a heaven on the earth, and there stands in it the city of Dhillí built by the Tomaras.
- 4. After the Tomaras, the Chahamans, who were ardent in protecting their people, reigned in that city, whose enemies were all overcome.
- 5. Next the Miechchha Sahábadín, (c) the fire of whose vigour had consumed to ashes the forest of his enemies, took the city by his might.
- 6. Thenceforward up to this day it has been in the possession of the Turushkas, and now the auspicious King Muhammad Sáhi (d) rules it.
- 7. Next. In that city dwelt a family of merchants of Agrotola. (c) In it was born a Sádhu, named Sava-deva.
- 8. His son was Laksh mídhara, who was like a bec on the two lotus-like feet of the lord of Laksmi (Vishnu). He was constant in the adoration of the gods and Brahmans, and was celebrated for his good-will towards all created beings.
- 9. He had two sons, both not of this sinful Kali ago, both like oceans of greatness; the first, by name Máhá, was of mature understanding; the younger Ghiká was of great fame.
- 10. Máhá had a beautiful son named Mehlá, who was always bent on worshipping the gods, Bráhmans and seniors.
- 11. Ghiká married the daughter of S'rldhara, named Viro, who was devoted to her husband. By her he had two sons.
- 12. The elder (of these two) was Khetala, an ocean of goodness and of polished behaviour. The younger was named Paitúka; (f) his mind was full of respect for all seniors and Bráhmans.
- 13. In the minds of these two merchants, (Sádhus) K h e t a l a and P a i t u k a, always disposed to meritorious works, a spot of ground outside the goodly village of Sárabal'a appeared agreeable.

- 14. There, for the eternal enjoyment of heaven by their parents, and for attainment of effspring, Khetala and Paituka caused a well to be excavated.
- 15. This was written on Tuesday, the 5th of the waxing moon, in the month of Phálguna, in the year of the Veda, Vashu, fire and the moon (g) of the era of Vikramárka.
- 16. In the village of Sárabala in the Pratigana (h) of Indraprastha, may this well last for ever, as also its maker with his family!

Samvat 1384, Phálguna Sudi 5, Tuesday.

Notes.

- a. Ganes'a.
- b. I know of no Hindu divinity of this name, and therefore suspect this to be a mislection of some other word for S'iva, the husband of Ambá.
- c. This is of course the Indian Corruption or Sanskritisation of Shihabuddin.
- d. In Sanskrit and old Hindi writings the Semitic Shah is generally written Sahi, with a dental sibilant and a final i.
- e. This is either the original, or a Sanskrit form, of the name of Agrá, the merchants or baniyás of which place are well known all over India as the Agarwálá baniyás.
- f. The u of this word is long in this place, but in the two subsequent stanzas it is short, according in the three different places to the exigencies of the metre; what its true sound is, is not ascertainable.
- g. The numerical value of the words being equal to 1384—thus; Veda = 4, Vashu = 8, fire = 3, and moon = 1.
- h. No Sanskrit Dictionary gives this word. It evidently stands here for a province or a district. Perhaps it is a mislection of *prutigata* "in front of."
 - सर्वाभीष्टपासं यस्य पदाराधनतत्पराः। खिस ॥ सभने मन्जासारी गणाधिपतये नमः॥ १॥ सत्यक्षे नाम वः पातु साम्बत्याम्बया सद् । प्रसादादासा देवसा भक्ताः सः गीखाभाजनम्॥ १॥ देशोसि इरियानाष्ट्राः श्रीययां सर्भे प्रतिभः। ढिजिकाच्या प्री तव तोमरैरिख निर्मिता॥ १॥ तोमराननारं यस्तां राज्यं निचतकण्डकं। चारमाना खपायतुः प्रजापालनतत्पराः॥ ४॥ चय प्रतापद्चनद्ग्धारिकुलकानमः। स्ने स्वावदीनसां वह्नेनाज्यस्य प्रीं ॥ ॥ ॥ नतः प्रस्ति भृता चा तुरम्नीयावद्य पूः। त्रीसरंगद्शारिकां पाति सम्मति भूपतिः॥ ६॥ तस्यां प्रयेखि विकासपातकनिवासिनां। चपिच ॥ वंगः बीवाबदेवाषाः साध्सावीद्वयत ॥ ०॥

स्वीधरस्तानयोवभव स्वीधराष्ट्रिद्वपद्मश्वः। देविद्वजाराधननिष्ठिचित्रः समस्त्रभूतावनस्थ्यकीर्तिः ॥ 🗸 ॥ स्वीधरस्य तनया किस्तासवाद्यावासामुभी मस्मवारिनिधी सुक्या। माचाभिधा निप्तन्बिरभूमदायो चीकाच्य उत्तमयमा चनुजस् तस्य॥ ८॥ माचाक्यस्याभवत्युचा मेक्कानामा मनोचरः। देवदिजगुक्षां यः सदाराधनतत्परः ॥ १० ॥ त्रीधरस्यातात्रां वीरे।नासीं भर्टपरायणां। घीकाविवादयामास तस्यामासाम्भा स्ता ॥ ११ ॥ ! च्छेष्ठस्रयोः स्रेतस्रनामधेयः साध्यपाद्याधिरननगीसः। पैतूकमामा च सम् समसगुरदिजाराधमशीसचित्तः ॥ १२ ॥ च्चितयोः खेतलपैतुकास्त्रमध्येः मदाकोत्तेनकर्मबृद्धोः। इयं ग्रामारावलाभिधानपामान्तभूरध्यवसत्स्र चिने ॥ १३ ॥ पिल्णामचर्थ सर्गप्राप्त्रीयनान रहरे। खेतलः पैतकसैव कारयामामृतः प्रस्ति ॥ १४ ॥ 'बेदबखग्रिचन्द्राङ्क् सङ्घोट्टे विक्रमार्कतः। पश्चम्यां फास्मनसितं लिखितं भीमवासरे ॥ १५ ॥ रुन्द्रप्रस्थप्रतिगणे यामे सारवलेन तु। चिरं तिष्ठतु कूपायं कारकस सवान्यवः॥ १६॥ संवत १६८४ फाल्म नग्रदि ॥ भामदिने ॥

2. Inscription from Na'da'yana, near Indraprastha.

- 1. Prosperity! He, (Ganes'a), who is known as the destroyer of every evil in behalf of those who seek his protection; who bestows every favour to those who adore him with salutation; who is the remover of misfortune—bears one prominent tooth like a crystal staff for the destruction of the enemies of the gods.
- 2. May Chandiká, who overthrows the enemies of the Lord of the Devas; who sits on the shoulder of the buffalo giant; who is bepraised by Hari, I's a, and the Lotus-born, for success of every kind; who quickly bestows rewards to mankind; who upholds the universe; who is the protrectress of my family; may she prove destructive to the sins of this world!
- There is a great and virtuous province named Hariyána, where Krishna,
 along with Pártha, careered for the suppression of sin.
 - 4. Therein exists the city of D hilli, embellished with innumerable jewels, whence sin is expelled by the recitation of the Vedas by the knowers of the S'rúti, and which is resonant with the music issuing from the tinkling of anklo-ornaments of charming damsels, even as the river of heaven is with the voice of geose.
 - 5. There was born the renowned Mahammad Sahi, the crowning jewel of all earthly lords, the vigour of whose arms had overthrown all enemies; the institutor of a new era; the mighty. When he proceeds on hunting excursions, through fear the earth trembles, the ocean dries up, the mountains shake, and his enemies fly to distant quarters.
- 6. Lineage described. There lived formerly in the village of Nádáyana a merchant of the name of Govinda Deva and his family, all performing many virtuous acts, and were the glory (lit. standard) of the Rohitaka race.

- 7. Unto Govinda Deva was born a clever son named Ratna, even as a jewel is produced from the ocean. By him the auspicious and constant Gaganás'ri' was taken for wife.
- 8. She bore unto him four renowned sons, the Ratnasádhus. These were Gangádhara, Mádhava, Lakshmana, and Dámodara.
- 9. The youngest among them, Dámodara, having married the beloved Virodá, obtained the auspicious Dhíra Deva, Krishna Deva, and other sons to the number nine.
- 10. Among them Dhira Deva, the intelligent and knowing, was possessed of every accomplishment, well versed in mercantile work, in buying and selling, and an excellent judge of the qualities of cattle, land, gold, stuffs and jewelry.
- 11. He married a noble and auspicious lady named Dháni. By her he had two sons, Risada and Sudeva.
- Risada had two goodly sons by his wife Rájásri', namely, Dullabha Deva and S'ríkara.
- 13. The intelligent S'rikara was well versed in the law, and devoted to the worship of the lotus-like feet of the lord of Sri (Vishnu). He had two wives of good parentage, Kallyá and Gangadis'rí.
- 14. By them he got three accomplished and excellent sons: Prithvidhara by the eldest virtuous lady, and S'ridhara and Solhana by the younger.
- 15. To the west of Indraprastha there is a village named Nádáyana. To the north of this village a well was caused to be excavated by S'rídhara for the gratification of his parents.
- 16. "Is this the water of the celestial river, cool, sweet, and wholesome? or is it nectar thrown here by the immertals?" Thus exclaims the travellor when he proceeds home after drinking the sweet clear water of this well.
- 17. Written by Mádana Dova in the year four, eight, fire and moon, (a) of the era of Vikrama. On Thursday the 3rd of the wane in the month of Bhádra.

Samvat 1384, on the 3rd of the wane in the month of Bhádra, Thursday. May good happen of this!

- (a) Fire equal to 3, and moon equal to 1. The figures, being transposed according to the usual practice in such cases, give the date 1384.
 - खित्त ॥ स्वृतः प्रकारहेदिनां निविस्ति विविद्यविष्ठां वितरती हिंदि । प्रश्नार । प्रश्नार यति विविद्यो रहनमेकमत्युव्यतः । प्रश्नार यति विविद्यो रहनमेकमत्युव्यतः प्रभेतृमिन नाकिनां स्तिटिकह्णुन्यं हिनः ॥ १ ॥ स्तरेन्द्रिप्ति हिनः ॥ १ ॥ स्तरेन्द्रिप्ति हिनः स्त्रा । स्ति स्वकृत्यहेनि स्वित्य विविद्यत्य स्त्रा । स्ति स्वकृत्यहेनता भन्द्रवेषि विविद्यत्य । १ ॥ स्तरे स्वकृत्य स्तरे स्वकृत्य स्तरे स्वविद्या । १ ॥ स्तरे स्वविद्या स्तरे स्वविद्या स्तरे । १ ॥ विद्या स्तरे स्वविद्या स्तरे । १ ॥ विद्या स्तरे स्वविद्या स्तरी स्वया । १ ॥ विद्या स्तरे स्वविद्या स्वया स्तरा । १ ॥ विद्या स्तरे स्वया स्वया स्तरी स्वया । विद्या स्वया स्वया स्वया । विद्या स्वया स्वया स्वया । विद्या स्वया स्वया । स्वया स्वया स्वया स्वया । स्वया स्वया स्वया स्वया । स्वया स्वया स्वया । स्वया स्वया स्वया । स्वया स्वया स्वया स्वया स्वया । स्वया स्वया स्वया स्वया । स्वया स्वया स्वया स्वया । स्वया स्वया स्वया स्वया । स्वया स्वया स्वया । स्वया स्वया स्वया स्वया स्वया । स्वया । स्वया
डिकीपुरी सुरमदीव विभाति रस्या रम्याजनाचरकनूप्रचंसमञ्देः तनाभूमाचमन्द्रसाचिरचिलचोशीशचुडामणि-र्विखाता निजवाङ नीर्यदक्षितारातिः प्रकेन्द्री वसी । वासाद्भुवस्तीच यस्य सगयाक्रीडावनीं गक्तः सिन्। ग्रेष्टित कम्पनाग्र हि दिशोयान्यहरोपि दिषः ॥ ५ वंग्रकथमं ॥ चासीदिणिग्वभूपरिष्ठतः प्राङ् माडायल्यामञ्जताधिवासः । गोविन्ददेवा वज्रपुणकर्मदचीन रोचीतकवंगकेतुः॥ 🕻 ॥ तसून्मुं स्वान् अप्रे रते। रत्निवान्त्रधेः। येनोहा वर्सिका पत्नी गगनात्री पतिवता ॥ ७ ॥ तस्यामजायम सताः प्रसिद्धाचनार एते किन्न रत्नसाधाः। गङ्गाघरी माधवस्त्रकास्त्रावन्यसु दामोद्रनामधेयः ॥ ८ ॥ सपुरीमोदरसेषां विरदां प्राय सुप्रियां। त्रीषीरदेवद्यक्षादींसमयांसभवात्रव्॥ ८॥ तेषामभूत्यवेक सास्तिको वाणिन्यकर्भक्रयविक्रयकः। गोभूसिचेसाम्बररविकाः त्रीधीरदेवा सतिसान् गुणकाः ॥ १० तेनोहाद्य ग्रमां पत्नीं धन्यां धानीतिवित्रतां। द्वावक्रजी रीगडाक्शसुदेवी जनिताविमी ॥ ११ ॥ राजत्रियां नासपत्नां रीसडः सत्सुताविसी। स्रेभे दुर्फभदेवाच्छं त्रीकरं च ततः परं ॥ १२ ॥ त्रीत्रीकरः त्रीवरपादपद्मसंसेवनक्षा सतिसान् विधिक्षः। सहंग्रजेसी लभतेस काने कन्नाभिधानीमयगंगदित्रीं ॥ १९॥ त्रीत्रीकरस्रेष कलासुद्धाः पुत्राख्योमी गुणिना वभूतुः। प्रचोधरा खेहपतिवतायां जातापरा त्रीधरमाळणाखी ॥ १४ ॥ इन्द्रप्रसादावसे दिम्मिमामे पामःस्थातीयसि नाडायसास्यः। यामाद्यादिख्दीचां पिट्रणां हतेत्र क्रूपः कारितः त्रीधरेण ॥ १५ ॥ किस सुरसरिद्भाः शीतसं मिष्टमिष्टं किमिस तदमरैका चिप्रमन्।सर्गं यत्। दति पथिकसमूचसासा कूपसा पीला सध्रम्दकमच्चं प्रस्वन् याति मे चम्॥१ (॥ कतिमंदनदेवस्य तुर्याशिमिमाकरे। विज्ञसाब्देऽसिते भादे हतीयायां गराहिने ॥ १० ॥ संवत् १२०४ मिति भाइवद् र गुरद्दिने ग्रामं भवतु ॥

Regarding these two inscriptions, Mr. Delmerick writes as follows:-

'By to-day's post I beg to forward for translation and publication copies of inscriptions on a couple of stone slabs now in the Delhi Museum.

'They have been carefully transcribed by Bisashar Nath, a learned Pandit and teacher of Sanskrit in a school in the city.

'The Náráina stone was given to me by Lalla Omra Singh, a member of the Delhi Municipality, and by me deposited in the museum. The inscription on it is in very good preservation. 'I cannot ascertain how the Sarban stone found its way into the museum. It has been there for several years, and the inscription on it is very much abraded and cut up, and the Pundit has had a great deal of trouble in decyphering it.

'When these stones were originally set up, Naraina was, as you will perceive, called *Narain*, and Sarban *Sarbal*. Delhi was also *then* known as Dhillí, and not Dehli and Dillí as *now* written and pronounced.

'The two wells to which these inscriptions relate appear to have been built by banias—and members of the same family within six months of each other, and during the reign of Muhammad-bin Tughluq in the Samvat year 1384, or A. D. 1327.

'Náráina is 7 miles S. W. of Delhi, and Sarban is 5 miles south of Delhi. The two villages are six miles apart from each other.

The following papers were read-

1. On the Genera Murina and Harpyiocephalus of Gray,—By G. E. Dobson, B. A., M. B., Staff Surgeon H. M's British Forces.

The Genus Murina was formed, in 1842, by Dr. J. E. Gray for the reception of Vespertilio suillus, Temm. which was shown to possess characters generically distinct from other species of Chiroptera, and later Vespertilio harpia, Pallas, was made the type of a new genus Harpyiocephalus by the same author.

These species remained the sole representatives of their respective genera till last year when two new species of *Murina* were added—*M. grisea*, Hutton, and *M. cyclotis*, Dobson,—and a second species of *Harpyiocephalus*, from the North-Western Himalaya was described by Dr. W. Peters under the name of *H. Huttoni*.

The genus *Harpyiocephalus* is distinguished from *Murina* according to • Dr. Gray* by having the wing-membrane attached to the base of the toes while in the latter genus it extends along the toe as far as the base of the claw; also by the hairiness of the feet and interfemoral membrane, and by, the possession, in adults, of a single premolar only, in the upper jaw.

I lately described a new species of *Murina—M. cyclotis*—which presents characters peculiar to both genera as given by Dr. Gray. It so resembles *Harpyiocephalus harpia*, Pallas, in the peculiar form of the nostrils, and the distribution, quality and even colour of the fur as to appear on a superficial examination to be an immature specimen of that species. But while thus agreeing generally with *H. harpia*, it differs in having the wing membrane attached to the base of the claws instead of to the base of the toes, and so belongs equally to both genera. This convinced me that the distinctions enumerated by Dr. Gray were not sufficient to separate these species

* Synopsis of the genera of Vespertilionida and Noctilionida; Ann. and Mag. Nat. Hist. 1866, p. 66.

into different genera, and as the name 'Murina' had the priority of Harpy-iocephalus I placed the new species in the former genus.

I was obliged to defer publishing these remarks till I should have had an opportunity of examining skeletons of both species. Meanwhile I received Dr. Peters's paper with descriptions of two of the species referred to above in which he adds that it is scarcely possible any longer to maintain *Harpyiocephalus* and *Murina* as distinct genera; he does not, however, unite them, probably for the same reason.

An examination of the skeletons of *Murina cyclotis*, and *Harpyiocephalus harpia* has confirmed the opinion previously formed of their affinity. The chief differences are to be found in the skulls, the remaining parts of the skeletons of both species corresponding in all respects.

Compared with *M. cyclotis*, the skull of *H. harpia* is much shortened in front of the anterior origin of the zygoma, the distance between the infraorbital foramen and the inner incisor being the same in both skulls, though their respective lengths are as 10:12. This shortness of the muzzle in *H. harpia* diminishes the length of the tooth-row and leaves no room for the third molar which is constantly absent in adult animals, probably pushed out by the growth of the other teeth. These might be regarded as important differences, were it not that two authors have mentioned the presence of an additional tooth in the young animal, and in Dr. Peters's description of *H. Huttonii*, a third molar is referred to.

The mandible of *H. harpia* is also, correspondingly shortened, and the teeth are crowded between the canine and the anterior edge of the coronoid process; the third molar is much smaller than the second, and being placed on the commencement of the ascending ramus is elevated by its longest cusp above the others.

The teeth in *M. cyclotis* are very similar to those in *H. harpia*, both upper premolars are large and bear about the same proportion to the canines and molars as they do in that species, agreeing in this respect with *M. grisea*, lately described by Dr. Peters,* but differing remarkably from *M. stillus* in which the first upper premolar is much smaller than the second which equals the canine in vertical extent.

In *H. harpia*, the skull is proportionately more swollen and elevated between the centres of the zygomatic arches than in *M. cyclotis*, and the sagittal crest much more developed; the bases of the skulls are very similar, the only difference observable being the greater backward prolongation of the palate bones behind the molar teeth in *H. harpia*, but this is perhaps more apparent than real as the absence of the third molar adds to the length.

The mandibles in both species have a striking generic resemblance in the elevation of the coronoid process above the condyle. In *H. harris* the coronoid process is probably more developed than in any other species of bat, and its outer surface is deeply hollowed out for the insertion of muscles. Its shape is very similar to that of the common Dog, but proportionately to the length of the jaw it is much more developed. Corresponding to this great development of the coronoid process of the mandible, the teeth are very stout and thickly coated with enamel; the cusps of the molar are short and blunt and the canines much thickened, the small incisors even presenting the same peculiarity.

In *M cyclotis*, the coronoid process is considerably clevated above the condyle, and its external surface is deeply hollowed, but its general form is triangular, not rounded as in the former species. The molars are stout and their cusps not so acute as in other species of *Vespertilionida*, resembling most those of *H. harpia*.

The peculiar form of the teeth of *H. harpia* is evidently connected with the nature of the food of the animal. The stout bluntly pointed teeth, well coated with enamel, are admirably adapted to crush the hard cases of coleoptera, especially of the larger kinds which a bat of the size of this species might be expected to capture. In the stomach of one examined by me the crushed cases of some species of these insects were found in abundance.

As we become better acquainted with the habits of these animals, it will probably be found that the food of this species is restricted to certain species of colcoptera possessing extremely hard cases which would effectually resist the feebler though more acutely pointed teeth of other bats inhabiting the same localities.

The form of the teeth, the great development of the coronoid process and shortness of the mandible, are all evidently subservient to the same object, and have become modified simultaneously to suit the food of the animal.

The teeth of the Asiatic and African Elephants differ much more remarkably than do the teeth of some species of bats belonging to very distinct families, and yet few zoologists venture to place them in different genera.

Professor Flower has well remarked that there is "too much importance attached to the characters of the teeth, their modifications depending on adaptation mainly, and not essentially indicative of affinity."*

The conjoined genera, united under the common name *Murina*, contain five species, enumerated above, of which *M. harpia* and *M. suillus* are most widely separated. These form a very natural group, readily distinguished from all other genera of *Vespertilionida* by the peculiarly shaped projecting nostrils taken in connection with the dental formulæ.

^{*} Proc. Zool. Soc. Lond. 1869, p. 5.

Note.—In a short paper, containing notes on some species of Chiroptera collected by Mr. Theobald in Burma, published by me in the 'Proceedings' for August, 1872, I mentioned that I had obtained specimens of Cynonycteris amplexicaudatus, Geoff. from North-Western India.

I have since learned from Mr. W. T. Blanford, who sent me these specimens, that I have given a wrong locality for them, as they were taken by him in the Nemakdun Salt Caves, Kishnu Island, in the Persian Gulf.

The mistake in the locality, referred to above, was due to the label sent by Mr. Blauford having been misplaced after the receipt of the specimens.

In the Proceedings for December last I described a new species of Vespertilio, collected by Captain W. G. Murray in Kashmir, under the name of V. macropus. I discovered since, quite accidentally (as there is no copy of the "Mammals of Australia" in Calcutta,) that this name had been used for an Australian bat by Mr. Gould and consequently cannot be again employed. I propose, therefore, for this new species the name Vespertilio longipes.

2. On the Asiatic species of Molossi.—By G. E. Dobson, B. A., M. B.

(Abstract.)

The paper commences with an account of the distribution of the species of this very remarkable and well defined group. The *Molossi* are divided into five genera, of which two only, *Nyctinomus* and *Chiromeles*, are found in the continent of Asia and its islands. By far the greater number of species belong to the genus *Molossus*, and are confined to the Western Hemisphere.

Two new species of *Nyctinomus* are described, one from Bengal and the Panjab, *N. tragatus*, and one from China, *N. insignis*. The former resembles *N. plicatus*, Buch. Ham. very closely in size and in general aspect, but differs in possessing a much larger tragus, in the development of the ears, and in the place of attachment of the wing membrane; the latter, a large species, had been named by Mr. Blyth in his Catalogue of the Mammals in the Museum of the Asiatic Society, but not described.

The number of Asiatic species of *Molossi* described prior to 1873 were three, one *Chiromeles* and two *Nyctinomi*, and to these three more are added, making six the total number now known.

The paper will appear in the Journal.

3. On Rhopalorhynchus Kröyeri, a new genus and species of Pycnogonida.—By J. Wood-Mason, Esq.

The paper will appear in Journal Part II, No. 3, 1873.

4. Note regarding certain type specimens of Batrachia in the Asiatio Society's Museum.—By W. THEOBALD, Esq.

The passage I wish to draw attention to in a paper of Dr. J. Anderson in the P. Z. S. of London for February, 1871, is the following: "It will be

observed that a number of Mr. Blyth's types of Batrachia in the Indian Museum have been identified. These are of peculiar interest, as Mr. Theobald was under the impression, when he drew up his Catalogue of the Reptiles in the Asiatic Society's Museum, that they had disappeared from the collection." On first being informed of this fact some time last year, I received the intimation with pleasure, thinking that I had been guilty of an oversight in the haste with which the Catalogue was compiled, but having recently had my attention re-drawn to the subject by Dr. J. E. Gray's repeated attacks on me, as regards the Testudinata, a full reply to which I am now preparing, I thought I would look into the "how and why" I came to overlook the above types, and the following is the result at which I have arrived, that whilst bearing full testimony to the patient research of Dr. Anderson, and the perfect fairness wherewith his remarks are written, I cannot but see there are some difficulties in the way of accepting his conclusion.

The first Batrachian type I was supposed to have overlooked, *Megalophrys gigas*, Blyth 71, is thus entered in Dr. Anderson's paper, and I cannot see how it is possible that Dr. Anderson can be right, but the facts are these.

"RANA LIEBIGH, Gunther.

Megalophrys gigus, Blyth, Jour. As. Soc. Beng. XX p. 410, XIII p. 299, and XXIV p. 717.

Rana Liebigii, Gth. p. 38, 1860 p. 157 pt. 28, fig. A.

Hylorana erythraa, Schlegel, Theobald Cat. Rep. As. Soc. Museum p. 84 (J. A. S. XIII supra is a typographical error for XXIII)."

Now the object I had in view in preparing the Catalogue was quite distinct from the far more laborious one subsequently carried out by Dr. Anderson, namely, a critical examination of each individual specimen, and was mainly to record the number and names of specimens in the As. Soc. Museum at the time, as they stood recorded, recently in Mr. Blyth's own handwriting, on the labels attached to the bottles. As Mr. Blyth had described two species of Megalophrys, as among presentations to the Museum, I entered both species with references in the Catalogue, but as I could discover no specimens of the genus in the Museum, nor any specimens having that name on their label, I presumed that they had been lost. Doubtless what did take place, with respect to the species claimed as re-discovered by Dr. Anderson, was that Mr. Blyth, being satisfied it was no Megalophrys, removed the label. There is, however, a difficulty in accepting Dr. Auderson's identification which has not been explained or alluded to. As a matter of fact, the specimen which Dr. Anderson considers he has identified as the type of Megalophrys Gigas, was presented by Capt. W. S. Sherwill from Sikkim, and was an adult male; whilst the specimen identified as the above type under Hylorana erythræa in my Catalogue was labelled in Blyth's handwriting as presented by Major Berdmore from Mergui, and is moreover a

large female! a fact corroborated by Dr. Anderson in re-examining the specimen. As stated by me the specimen was really labelled by Blyth nigro-vittatus, which I have ranked as a synonym of ERYTHRŒUS, and was the type of that species.

The next species to which I would advert is Diplopelma Berdmorei, Blyth, which Dr. Anderson charges me with confounding with D. pulchrum, Gth. Now Dip. Berdmorei is one of the commonest and best marked frogs in Pegu, and I am perfectly familiar with it; yet Dr. Anderson had full warrant for what he said, for by a ridiculous typographical blunder Dip. Berdmorei is printed in italics, as though a synonym of the preceding species, the name of which, being an Indian frog is entered by me according to my plan, though no specimens were in the Museum. Dr. Anderson was really mistaken in this matter, he was fully justified in what he said so far, but I am not convinced that his recognition of the types said to be missing is correct. Dip. Berdmorei is subject to very little variation in colour or size, and it is more likely than not, that among four specimens from any part of Burmah he could find one which "accurately agrees with Blyth's measurements." As a matter of fact, however, the 4 bleached specimens catalogued by me, were labelled as presented by Col. Phayre from Arakan, whilst the type of " Engystoma Berdmorei, J. A. S. XXIV p. 720, was presented by Capt. Berdmore from Schwe Gyen. I cannot therefore hold that the authority of an original label can be superseded on the grounds of an accidental agreement or measurement in a frog subject to such slight variation as that in question. I am not aware if I am supposed to have overlooked any other types than the above, which it appears in the last degree questionable if I really did overlook, but I merely bring forward the subject in order that so curious an error of so accurate an observer as Dr. Anderson should not be perpetuated, to the bewilderment of whoever may hereafter desire to examine Mr. Blyth's types.

Dr. Stoliczka regretted that Dr. Anderson was not present to explain the mistake complained of by Mr. Theobald. He said that though he had in this case little doubt about the correctness of Dr. Anderson's specific identifications, still a mistake about Blyth's typical specimens might have occurred, unless specimens from different localities, but belonging to the same species, had been put together in the same bottle with the type specimens. In such cases one could really do no more than select that specimen as the type, which precisely agreed with the original description.

5. A Contribution towards a Monograph of the Passalida.—By Dr. F. STOLICZKA.

(Abstract.)

The author said that his object in examining the Indian representatives of this family was chiefly to test the views expressed by Dr. Kaup regarding their classification in a recent Monograph of the *Passalida*. The present communication is only preliminary to a more extensive monograph, but the author thought it desirable to put on record the results which he had at present obtained, because he was shortly to proceed with the expedition to Central Asia, which might last for nearly two years.

There are 29 species enumerated in the paper. Regarding several of the known ones, notes on distribution, etc., are given, and eight species are described as new. All the species which are known to occur in India, including Ceylon and Burma and the country extending southward to Singapore, have been noticed. The arrangement of the groups and genera adopted by Kaup in his recent monograph has been followed. The paper will be published in the third number of the Journal.

The author did not claim to be a supporter of the views of the philosophical school of naturalists, but he spoke in a few general terms on the principles of classification, adopted by Dr. Kaup, a classification of which Dr. Kaup may almost be called the originator, and of which he certainly is the most important representative and the greatest supporter. The principle which the philosophical school, as represented by Kaup, adopts, is briefly the following. The naturalists say that we have to arrange our zoological specimens according to three heads—first, according to the anatomical system; secondly, according to the organ of sense; thirdly, according to the different parts of the body; these being the three chief constituents which make the animal what it is. Arranging the different components of each of these according to their value we obtain the following table.

	A. Anat. system.	B. Sensc.	C. Part of body.
I.	nervous	eye	head.
11.	respiratory	ear	chest.
111.	osseous	nose	rump.
IV.	muscular	tongue	belly.
v.	dermal	sex	sacral region.

Now, to give an example—the class of animals in which the nervous system, the eye and the head, in proportion to the body, become most highly developed is undoubtedly the *Mammalia*. In the same way we get for number II. the birds, as the type of respiration-animals, the third the Reptiles (with the Amphibians), including the most voluminous forms, the fourth the Fishes with the belly most developed, and the fifth the Mollusca. These five classes are regarded as the members of the first sub-kingdom. The addition of the Mollusca to the other four does not look a very fortunate one, and it would be perhaps more appropriate to separate the Amphibians from the true Reptilians, as they are in reality two entirely different classes. Again it does look very strange that in the fifth division the sexual system is entered as corresponding to the eye and ear, and it is not apparent why

the sacral region should be the most developed part of the body in the Mollusca.

The general plan exhibited in the above table is, however, followed by Dr. Kaup through all the five sub-kingdoms. Thus, he places—and I think rightly—the Psittacidæ, as the most highly organised of birds, in the first family of the five tribes into which the birds are divided. On the same principle the Brevipennes with the Dinornidæ form the centre of the third tribe, and the Gallinaceæ, which are the most stupid birds, take the lowest position. Among Reptilians the Chameleontidæ are the highest, and the Dinosaurii the largest; the former belonging to the first, the latter to the third tribe.

The above table is thus applied to every group, and is carried into the greatest detail in the Passalidæ. The largest known form, Proculus Goryi, is considered as the centre of the family, which is separated into Aulacocyclinæ Eriocneminæ, Proculinæ, Neleinæ, Passalinæ. Dr. Kaup complains, that naturalists very often mistake analogies for affinities. Nature, he says, does not like affinities, but dissimilarities, and consequently in a natural arrangement not the species following each other, but always the next following is affined to the preceding. Each genus of the Passalidæ is thus divided into five species, of which the first is small and most convex, the second smallest and most depressed, the third the largest, the fourth smaller and the fifth the next largest. This system is carried out in a really most wonderful way, and the exceptions to it are apparently very few. Only in one instance, in the genus Basilianus, has the author described seven species, but these form two different groups, which are, however, by Kaup himself regarded as belonging to the same genus. In Leptaulax one species is added, but another which Dr. Kaup adopts, is believed to be merely a synonym. This new law of development, or whatever it may be called, is believed by its originator to be the greatest discovery which systematic zoology has made. We must leave it to time and research, which will no doubt tell us the real value of this practical philosophic idea. In the present instance the author thought it only desirable to bring the rudiments of the system. as stated by Dr. Kaup, before the members of the Society, and expressed a hope that somebody would give a little thought to it.

Speaking of recent suggestions, Dr. Stoliczka thought he might allude to one affecting the system of nomenclature in Zoology. All these suggestions, whether they become generally acknowledged or not, shew the direction in which the working zoological minds of men are at present occupied.

Professor Harting in Utrecht has recently drawn the attention of zoologists to the unsatisfactory conditions under which zoological nomenclature labours. The number of names is becoming so varied and so alarmingly large, that no human mind can remember these heterogeneous appellations.

A more rational nomenclature is, therefore, desirable, as an aid to the memory. This, Harting says, should be so constructed that any naturalist from hearing the name pronounced should immediately know to which group a certain animal belongs. His suggestion is to the effect that all the higher divisions should terminate in res. Now, for each of the five principal divisions of the animal kingdom, he takes one of the vowels, a, e, i, o, u, and thus we shall have—

```
I. Vertebrata
                               Ares
                                              Spondylozoa.
II. Articulata
                               Eres
                                               Arthrozoa.
III. Mollusca (or Saccata) =
                              Iros
                                              Malacozoa.
IV. Radiata
                              Ores
                                              Actinozoa.
                                        ==
V. Coelenterata
                              Ures
                                              Amorphozoa.
                                        =
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Taking No. I, as an example, he proposes to prefix the term ares with different consonants, in order to form names for the sub-divisions, thus—

```
        Mammalia
        =
        Pares.

        Aves
        =
        Cares.

        Reptilia
        =
        Fares.

        Pisces
        =
        Sares.
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Retaining the Pares as a further example, Harting proceeds further to divide them thus;

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Placentalia=Plares.Didelphia=Prares.Erpetodelphia=Psares.
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Then the Placentalia or Plares are sub-divided:

Bimana or Hominidæ	==	Amplares.
Quadrumana	=	Acplares.
Chiroptera	=	Atchphares.
Carnivora	=	Asplares.
Rodentia	=	Arplares.

As a further example of the system proposed, the Arplares or Rodentia are taken, and divided thus into:

```
Sciurina = Larplares.

Castorina = Carplares.

Arvicolina = Sarplares.

etc.
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Then the Sciurina or Larplares are divided into a certain number of genera for which the termination a, as indicating a mammal should be adopted (e, in case of birds, etc). Thus we get:

```
      Sciurus
      Sciularpla.

      Pteromys
      Pterolarpla.

      Spermophilus
      Spermolarpla.

      Arctomys
      Arctolarpla.

      Tamias
      Tamolarpla.

      Myonus
      Myolarpla.
```

No generic name should exceed five syllables.

This system would of course answer admirably if we could calculate mathematically the number of existing genera and species, or if our science were concluded and not undergoing a constant change; but as these conditions do not obtain, it is not likely that the system will find many supporters. Still the suggestion has thrown been out, and discussion on the subject has been invited, because it is a very important one, and because the want of regulating our nomenclature in some way or other is generally felt.

Mr. Phear did not pretend fully to apprehend Kaup's system, but he would ask Dr. Stoliczka, whether the method of separating species by reference to three cardinal characteristics each taken out of a set of five, did not of itself immediately lead to the grouping of species also in sets of five. Each single set of five species might of course be defined as constituting a genus; or a definition of genus might be made in reference to the same characters such as would lead to the like result. But he confessed that he could not understand how in any other than some such way as this, any principle of arrangement deserving to be called a natural principle could bring about such very artificial looking classes, as Dr. Stoliczka mentioned.

In reply to Mr. Phear's observation Dr. Stoliczka stated that the number five selected by Dr. Kaup is, according to him, by no means arbitrary. It is dictated by the five anatomical systems, etc.. Any other larger or smaller number would of course not suit the theory. The classificatory number five is an old one, chiefly introduced by Oken, and Swainson used it in Ornithology. As regards the second point, Kaup's answer is decided. says, for instance, that anybody who has thoroughly understood his reasoning, will see that a larger form of PASSALIDE than Proculus Joryi cannot exist. In the same way he states that a sixth species in the same genus cannot exist, if it be really a good species, and not a variety of either of the other five. Should anybody find a sixth species in one genus, and should there be no mistake in the generic definition itself, the system would of course be invalidated. Kaup says that he would be the first to give it up, if really convinced of the fact. The system itself, of course, requires improvements, probably alterations in the minor arrangement, which may be suggested by the discovery of new species. There can be no doubt, Dr. Stoliczka said, that Kaup's definitions of the genera and species are on the whole wonderfully correct. It is very difficult to find a single mistake, and if anybody come to the conclusion that he has discovered one, he will do well to revise his materials repeatedly, before he puts forth his statement as final. Dr. Stoliczka said he was speaking from experience in throwing out this suggestion.

Mr. Blanford said that from Dr. Stoliczka's account of Dr. Kaup's theory, it appeared to him to be a retrograde attempt. . "The great value of Darwin's theory is, that it had rendered Natural History a Science of causes

and effects, and had taught modern naturalists to regard classification as true only when it is based upon those affinities which result from community of evolution. A true classification therefore on this view is to be regarded as the final result of the science, and is to be patiently worked out by studying the causes that have determined it. Dr. Kaup's system sweeps away all this, and seeks to impose in its stead, an arbitrary Procrustean plan of creation, fanciful and mystical to the last degree. It is allowable and even beneficial in the early days of a Science to adopt an artificial classification of objects, since any arrangement is better than none. But to seek to impose such a system on the Zoology of the present day, and to sort and manipulate species and genera to make them succumb to an a priori hypothesis, appears to be an attempt to set up as a leading principle of science the maxim "Si les faits ne s'accordent pas avec ma théorie, tant pis pour les faits."

Dr. Stoliczka, in reply, expressed his astonishment at Mr. Blanford's unjustifiable remarks. He said that that was not the way to treat mental productions. Dr. Kaup was an old naturalist of very high standing, and his system, as proposed, was by no means a fanciful one; it was based upon those characters of organisation which make the animal what it is-and that was no fancy. Philosophic systems had from time immemorial occupied the greatest minds, and not fancies. Dr. Kaup had not only not thrown out a suggestion of a fanciful arrangement, but he hadgiven his system a definite form, he had established rules, he considered that he had found the law according to which nature works in development, and that only according to this could the animals exist. He had given a fair test to his system in working out one group of animals in the most minutely detailed manner, and he asked the scientific world for an opinion, whether he had succeeded in this or not; he wished to be disproved, if wrong. Now, how unfair it would be, if all this mental work were to be rejected with phrases. We required first of all facts, not words or ideas. Dr. Kaup's definitions of genera and species were not made up in the first instance according to a fanciful scheme, they were drawn from the animals themselves. Careful observations and facts were the ground on which we must in the first instancemeet Kaup. Philosophic treatment of the facts must follow, in order to so meet the genial naturalist.

Dr. Stoliczka said he had taken up the study of the *Passalida*, because he wished to test Kaup's conclusions on his own materials, and because he thought it a priori almost impossible that a really natural classification would be obtainable in the way suggested by Kaup. After devoting some time to this subject—certainly only with scanty materials—he must express his grave doubts as to the validity of the system in the form at present proposed by Kaup; but he would be sorry to have spoken, if he had said that the system was really invalidated by his researches. He was not prepared to say that.

Such an elaborate system as this had full claim to be heard on the audi alteram partem principle; we must not presume that it was wrong, because it was so very simple. People very often overlook things nearest them. Hasty conclusions would, in this instance particularly, be absolutely of no value at all.

6. Notes on some Andamanese and Nicobarese Reptiles.— By Dr. F. Stoliczka.

(Abstract.)

After a few general remarks relating to the distribution of certain Reptiles on these islands, the author gives a detailed description of *Phelsuma Andamanense*, of a new *Gymnodactylus* from Preparis Island, of a new *Mocoa* from South Andaman, and of a new *Tiaris* from the island of Tillangchang. He exhibited a male and female of the remarkable little snake *Typhloscincus Nicobaricus* which is shewn to be a *Dibamus*, the males of which have hind-limbs while the females have none, thus confirming an opinion, which was some time ago put forth by Prof. Schlegel.

Mr. G. E. Dobson exhibited and presented to the Society's album photographs of a mosque at Tribeni near Hughli taken by him in December last.

The place was described by Mr. D. Money in the XVIth Vol. of the Society's Journal, and its Muhammadan antiquities by Mr. Blochmann in the XXXIXth Vol. part I, p. 280, for 1870.

Also the following photographs of the aboriginal inhabitants of the Southern Andaman Island, taken by him, with Mr. T. R. Lewis's assistance, when at Port Blair last year.

- No. 1. A photograph of the Chief of one of the tribes in the vicinity of Port Blair and his wife, with necklace of finger and toe bones of her an-
 - No. 2. Photograph of the same individuals standing.
 - No. 3. Photograph of a woman from Rutland Island.
 - No. 4. Group of five young Andamanese women.
- No. 5. Group of Andamanese men and women. Widow in centre with skull of her deceased husband.

The receipt of the following communications was announced—

- Notes and translation of General Cunningham's inscriptions from Behar.—By Bábu Pratápa Chandra Ghosha.
 - 2. Metrical Translations from Chand.—By F. S. Growse, Esq., M. A.
- 3. Note on the genus Gymnops.—By W. T. Blanford, F. G. S., C. M. Z. S.
- 4. On Aquila bifasciata and Aquila orientalis.—By W. E. Brooks, Esq. C. E.

- 5. Algæ collected by Mr. Kurz in Burma and Arrakan, determined by Dr. Zeller, High Councillor of Finance in Stuttgart.
- 6. Descriptions of two new species of Indian land-shells.—By Dr. F. Stoliczka.

LIBRARY.

The following additions have been made to the Library since the Meeting held in March last.

Presentations.

*** Names of Donors in Capitals.

Bulletin, Fevrier, 1873.

L'Albé Desgodins.—Mots principaux des langues de certaines tribus qui habitent les bords du Lan-tsang kiang, du Lou-tze-kiang, et de l'Irrawaddy. Francis Garnier.—Navigation du Yang-tse-kiang. Legrand de la Liraye.—Expédition du Bourayne.

Delaporte.—Le Tong-King. La Chaine des Garos. Les Louchäis. Lettre du Japon. Explorations Russes dans l'Asie Centrale.

THE GEOGRAPHICAL SOCIETY OF PARIS.

Instructions for testing Telegraph Lines and technical arrangements in office, by L. Schwendler, Part II, Section I.

THE AUTHOR.

Pratna Kamra Nandini, Vol. V, Nos IX-XII.

THE EDITOR.

The Calcutta Journal of Medicine, Nol. VI, Nos. 1-2.

THE EDITOR.

The Christian Spectator, Vol. VI, No. 26.

THE EDITOR.

The Flora Sylvatica, Parts XV and XVI.

THE GOVERNMENT OF INDIA.

Report of the Charitable Dispensaries under the Government of Bengal for 1871.

Report on the Administration of the Income Tax in 1871-72.

The Proverbs of the inhabitants of the Chittagong Hill Tracts, by Capt. T. H. Lewin.

THE GOVERNMENT OF BENGAL.

General. Report on the Revenue Survey operations of the Upper and Lower Provinces for 1871-72.

THE SUPERINTENDENTS OF THE REVENUE SURVEY.

Palseontologia Indica, Cretaceous Fauna of Southern India, Vol. IV. p. 3.

F. Stoliczka.—The Echinodermata.

THE SUPERINTENDENT OF THE GEOLOGICAL SURVEY OF INDIA. Shaháb Sáqeb, by Maulavi Zil-lul-Karim.

HABIBAR RAHMA'N.

Exchange.

Nature, Nos 174-178.

Purchase

The Indian Antiquary, Part XVI.

G. H. Damant.—On the dialect of the Palis. Dr. Buhler.—Abhinanda the Gauda. Rev. M. Phillips.—The Seven Pagodas. Capt. J. S. F. Mackenzie.—On the rules which govern Kanarese Poetry. P. M. Purnaiya.—The Calendar of Tipu Sultan. Service Tenures in Ceylon. Archæology of Maisur.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent thereon.

Date.	Mean Height of the Barometer at 32° Faht.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
	Mean H the Ba at 32°	Max.	Min.	D.ff.	Mean I	Max.	Min.	Diff.
	Inches	Inches	Inches	Inches.	0	0	0	0
1 2 8 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 12 22 3 21	29 827 .780 .743 .678 .692 .765 .839 .837 .780 .726 .619 .6619 .653 .716 .751 .751 .787 .862 .838 .783 .783 .783	.749 .752 .846 .901 .933 .860 .809 .699 .631 .693 .736 .720 .788 .815 .867 .974 .908 .818 .804 .816	.631 .695 .765 .762 .692 .654 .522 .494 .551 .683 .694 .787 .773 .714 .650 .654	.170 .140 .121 .151 .136 .171 .168 .165 .177 .137 .132 .132 .125 .125 .125 .187 .134 .154 .168	88.7 83.6 81.0 82.9 80.5 81.0 83.0 83.8 86.3 85.3 87.6 87.6 87.6 87.6 87.6 87.6 87.6 87.6	94.7 93.5 91.0 93.6 87.7 87.3 90.0 98.5 102.0 103.5 101.9 99.7 96.2 99.7 94.3 87.4 81.0 85.5 93.5	76.0 76.0 78.5 78.0 80.2 77.5 76.6 71.5 77.8 78.2 78.6 80.0 80.2 81.9 80.0 77.5 71.7 73.0 71.6 73.6	18.7 16.5 15.5 16.8 12.2 10.7 15.5 19.0 21.6 21.7 16.8 19.7 16.8 19.7 11.0 14.5 11.0 14.5 11.0 14.5 11.0 14.5 11.0
25 26 27 28 29 80	.754 .715 .697 .694 .729 .692	.828 .777 .762 .757 .818 .753	.661 .634 .615 .608 .665 .599	.167 .143 .147 .149 .153 .156	86.4 86.7 87.2 84.2 79.3 80.4	94.8 96.8 96.0 94.8 84 2 92.0	80.5 81.0 81.0 73.5 75.0 76.0	13.8 15.3 16.0 21.3 9.2 16.0

The Mean Height of the Barometer, as likewise the Dry and Wet Buth Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Honrly Meteorological Observations taken at the Surreyor General's Office, Calcutta, in the month of April 1873.

Daily Menns, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

Date :	Mean Wet Bulb Ther- mometer.	Dry Buib above Wet.	Computed Dew Point.	Dry Bulb above Dew Pour.	Mean Elastic force of vajwur.	MeanWeight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humi- dity, complete satu- ration being unity.
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[.]Ail the Hygrometrical elements are computed by the Greenwich Constants.e

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Hour	ean He gut 3 Baromete 32° Faht.	Range of the Barometer for each hour during the month.			Dry Bulb	i ture	Range of the Tempera- ture for each hour during the month.		
	i ganga	Max.	Miu.	Dia:	ne n	Max.	Min.	Din.	
	Inch	Luch	Inches.	Inches.	,	' o	. 0		
		111(11)	THE IN S.	inches.	Ū	Ū		•	
Mad- night.	29.745	29.870 !	29.560	0 310	80-1	83 5	727	10.8	
I	.735	.853	.515		79.8	83 2	72.4	10.8	
2	.723	.811	.529	.312	79.3	82.8	71.8	11.0	
3	.711	.826	.518	.308	79.0	82 1	715	10,9	
4 5	.710	.838	.529	.309	78.6	82.0	71.3	10.7	
5	.722	.851	.511	.307	78.4	82.3	710	11.3	
6 j	.710	.876	.572	.301	78.2	82 ()	710	110	
7	.761	.957	.598	.359	78.8	82.5	715	11.0	
8	.787	.974	.620	.354	81.0	85 0	720	13.0	
9	.797	.938	.625	.313	83 9	88 0	73.1	14.9	
10	.802	.942 .922	.631 .622	.311 .300	86.6	91.7	75.6	16.1	
11	.787	.922	.022	.300	88.9	95.5	76.7	18.8	
İ		!	1			1			
		202	•	200					
Noon	.771	.892	.602	.290	90.8	98.5	763	22 2	
1	.742	.831 .857	.574	.307 .306	92.2 93 0	100.6 102.5	800	20.6	
2	.712 .687	.849	.551 .526	.323	92.7	102.5	80 5 74 7	$\begin{array}{c} 22.0 \\ 28.7 \end{array}$	
3 4	.673	.835	.505	.330	91.6	103.5	73.2	30.3	
5	.666	.825	.491	.3:1	89.7	1020	75.0	27.0	
6	677	.851	.491	.357	86.8	97.5	73.5	24.0	
7	.694	,833	.513	.320	81.5	93.0	75.0	18.0	
8	717	.816	.551	.292	82.7	88 4	74.5	13,9	
9	.739	.861	.581	.280	81.8	86.7	74.0	12.7	
10	.753	.878	.580	.298	81.1	85.1	74.5	10.9	
11	.682	.873	.574	.299	80.4	81.6	73.0	11.6	
1		}		ļ	i	;	1		
1	1		!		•	!	1		
· <u> </u>						· ·			

The Mean Height of the Barometer, as likewise the Dry and Wet Bubb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of April 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon —(Continued).

			77/ 11/1/ 110		COMMIN			
Hour.	Mean Wet Bulb Ther- monucter.	Dry Buib above Wet.	Computed Dew Point.	Dry Rulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic igot of air.	Additional Weight of Vapour required for compitte saturation.	Mean degree of Humidity, complete sutura-
	o	0	0	0	Inches.	T. gr.	T. gr.	
Mid- mght. 1 2 3 4 5 6 7 8 9 10	77 1 76.8 76.6 76.4 76.2 76.1 76.5 77.6 78.7 79.4	3 0 3 0 2.7 2 6 2.4 2.3 2.1 2.3 3.4 5 2 7 2	75 0 71.7 74.7 74.5 74.5 74.6 74.6 75.2 75.1 75.1	51 46 4.1 39 36 3.9 58 81.5	0 854 846 816 813 810 810 813 851 860 857 857 840	9.22 .14 .13 .11 .11 .12 .21 .21 .17 .12 8.92	1.62 .61 .45 .37 .27 .20 .13 .29 .90 2.96 4.02 5.12	0.85 .86 .87 .88 .88 .89 .89 .83 .76 .69
Noon. 1 2 3 4 5 6 7 8 9 10 11	80.0 80.4 80.6 80.3 79.8 79.1 78.7 73.3 77.7 77.8 77.4 77.1	10 & 11.8 12.4 12.4 11.8 10.6 8 1 6.2 5 0 4.0 3.7 3.3	73 5 73.3 73.2 72 9 72 7 73.8 74.0 74.2 75.0 74.8	17 3 18.9 19.8 19.8 19.9 17.0 13.0 10.5 8 5 6 8 6 3 5.6	.81 1 .809 .806 .797 .792 .792 .822 .827 .832 .851 .849	.60 .50 .46 .38 .35 .35 .75 .84 .93 9.18 .15	6 24 .95 7.35 .80 6.81 4 16 3 51 2.79 .22 .02 1.79	.57 .54 .53 .55 .58 .66 .72 .76 .81 .82
	• 1							

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of April 1873.

Solar Radiation. Weather, &c.

		ə, ə, .	Wind.			l
	So intro	da . da .	Prevailing direction.	Max. Pressure	Daily Velocity	General aspect of the Sky.
	138.0	Inche	S by W & S	H	M iles 199.0	
3	137.8 142 0		S&S by E , S by W ASSW	_	203 5 260 5	B to 5 A. M., i to 11 P. M. i to 11 P. M.
í	137 2 120.0		SSWAS SSWAS	2 5	$\frac{2717}{1287.4}$	i to 5 a. m., i to 11 a. m., i to 4 p. m., i to 10 p. m. O to 5 a. m. S to 7 p. m. O to
6	129.0		s & s s w	•	179 2	to 11 P. M.
- 1	122.0 143.0		S by E & S S S W & S by E	06	88 5 123 8	' Chiefly O.
	140.4		S by E, Sby W&S	1	157.8	B to 6 a. M. Si to 10 a M. B to 12 a M. X Si to 4 P M.
	143.5 149.5		SSW&SW SW&SSW		232 3 262.1	1 2.7
12	151.5		SSW&SW		245 2	В
13	143.0		SW&SSW		154.2	
14	145.7		SSW & S by W		221.0	Scuds to 9 A. M. B to 9 P. M. Scuds to 11 P. M.
15	145.3		8 S W	0.2	220.1	Scuds to 8A. M. Btolp. M., Tito
10;	140.0			٠.٣	, 55	4 P.M. B to 8 P.M., oi to 11 P. M.
16	142.8		SSW&S		200.7	wi to 10 A. M. B to 11 P. M.
	144.0		SW&S		200.3	Chiefly B.
18	143.6		8 S W & S		258.3	Chiefly hi Brisk wind from
						11 A. M. to 11 P. M. Lat 10 & 11 P. M. Dat 10 P. M.
10	115.2	0.20	SE&SSW	9.2	322.4	
10,	110.2	0.20	220001			wi to 7 p. M., S to 11 p. M.
						High wind from 61 to 71 A. M.
						L at midnight and from 9 to
						11 P. M. T at 62 and 72 a. M. Slight R from 62 to 9 A. M.
20	113.8	1.02	S S E & Variable.	0.8	135.8	S to 7 A. M., O and wi to
	110.0	1.02	D D 12 G T GITADIO.	5.0		11P. M. Tand R from 11 A. M.
						to 4 P. M.

i Cirri,—i Strati, i Cumuli, Li Cirro-strati, i Cumulo-strati, i Nimibr. Li Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta,
in the month of April 1873.

Solar Radiation, Weather, &c.

1.5 4 12 5.	Wis	vD.	
Max. Sola radiation. Rain Guag 14 ft. abov	Prevailing direction.	las Pasily	E General aspect of the Sky.
o luche 21 132.0 0.15	N E & Variable.	Mil . 0.5 185	
22] 137.0 23] 139.0	sswas		5 Chiefly B. 10 B to 7 A. M., Seuds and a i to 1 11 P. M. B to 11 P. M. Brisk wind from 8 to 11 h A. M., L on Nat 8
24 140.2	SE&S	1.0 252	P. M. D between 9 and 10 P. M. B to 7 A. M., ci to 2 P. M., clouds of different kindtoll P. M.
ĺ	S by E & S by W	j	Brisk wind from 31 to 6 1 P. M.
26 145.5	S by E & S	2.3 275.	Brisk wind from 1½ to 8 p. m. Brisk wind from 1½ to 8 p. m.
27 142.0	S S E. S & S by 1	1.7 298	Freds to 9 A. M., B to 11 P. M. Brisk wind from 21 to 6 P. M., Tat 6 P. M.
28 148.0 0.40	S & S by E	30.4' 278.	
29 133.8 0.07	E	3.5 273.	3 Oto 12 a.m., clouds of different kinds to 11 p.m. High wind from 9\forall to 10\forall a.m., T at midnight, 1, 10\forall a.m., and 2\forall p.m. L at midnight. Slight R between midnight and 1 and 10 and 11 a.m.
30 142.7	SSE&E by S		B to 4A. M., S to 8 A. M., \(^1\) to 4 P. M., S to 9 P. M., B to 11 P. M. Brisk wind between 4\(^1\) and 5\(^1\) P. M., T from 4 to 6 P. M., D at 2\(^1\) and 4\(^1\) P. M. i Cumulo-strati, \(^1\) i Ninibi,
√1 Olfri, —1 Olfal u, i Cumun, Ci C	. 17 7 A. DAT MOI	Les camaiositant Art Hilliol	

Li Cirro-cumuli, B clear, S stratoni, O overcust, T thunder, L lightning

R. rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surreyor General's Office, Calcutta, in the month of April 1873.

Monthly Results.

		1	nches.
Mean height of the Barometer for the month			29.733
Max, height of the Barometer occurred at 8 a. m. on the			29.974
Min. height of the Barometer occurred at 5 & 6 P. M. or	a the 12	th	29.494
Lixtreme range of the Barometer during the month			0.480
Mean of the daily Max. Pressures	•••		29.809
Ditto ditto Min. ditto	•••		29.658
Mean daily range of the Barometer during the month		• • • •	0.151
- · · · · · · , · · · , · · · · · · · · · · · · · · · · · · ·	••••	•••	
			-
Mean Dry Bulb Thermometer for the month			84.2
Max. Temperature occurred at 4 r. M. on the 12th			103.5
Min. Temperature occurred at 5 & 6 A. M, on the 21st			71.0
Extreme range of the Temperature during the month	•••		32.5
Mean of the daily Max. Temperature	•••	•••	93.8
Mean of the daily Max. Temperature Ditto ditto Min. ditto,		•••	77.3
Mean daily range of the Temperature during the month		•••	16.5
zarowa wary range of one zompremate waring one mount	•••	•••	20.0
<u>Constitution</u>			
Mean Wet Bulb Thermometer for the month			78.1
Mean Dry Bulb Thermometer above Mean Wet Bulb The	****		
Computed Mean Dew-point for the month	rmome		6.1
Mean Dry Bulb Thermometer above computed mean Dew	 . maint	•••	73.8
Mean 17ry 13th Thermometer above computed mean 17ew	-point	•••	10.4
		I	nches.
Mean Elastic force of Vapour for the month			0.822
	•••	•••	
E			
		Troy	grain.
Mean Weight of Vapour for the month			8.80
Additional Weight of Vapour required for complete satu	ration		3.44
Mean degree of humidity for the month, complete saturatio	n being		0.72
•	G	•	_
Mean Max. Solar radiation Thermometer for the month			0 138 3
Mean Liex. Solar radiation Thermodicter for the month	•••	•••	1.00 0
*			
		T.	ches.
Pained 9 days May full of pain during 9 thouse	-		
Rained 8 days,—Max. fall of rain during 24 hours		•••	1:02
Total amount of rain during the month Total amount of rain indicated by the Gauge* attached to	the an	.;.	1.84
			1:58
meter during the mouth	s.	a "#	17.00 A. Q
Prevailing direction of the Wind	ø.	D. 11	a. o.

[•] Height 70 feet 10 inches above ground.

Abstract of the Bosults of the Hourly Meteorological Observations taken at the S. G. O. Culcutta. in the month of Abil 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour. when any particular wind was blowing, it mined.

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	X. X. W.	
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ä	Rain on.	
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Ξ.	Rain on.	——————————————————————————————————————
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	Hour.	Mid Birth Mid Bi

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR JUNE, 1879.

The Monthly General Meeting of the Society was held on Wednesday, the 4th instant, at 9 P. M.

Col. H. Hyde, R. E., President, in the Chair.

The minutes of the last meeting were read and confirmed.

The receipt of the following presentations was announced-

From the Trustees, Indian Museum, a set of the Minutes of the Trustees, Vols. I to V.

The following gentleman, duly proposed and seconded at the last meeting, was balloted for and elected an Ordinary Member—

J. W. Johnston, Esq., M. D., 4th P. I.

The following are candidates for ballot at the next meeting-

H. M. Durand, Esq., C. S., proposed by J. Wood-Mason, Esq., seconded by J. H. Rivett-Carnac, Esq., C. S.

Captain Fraser, 3rd Madras Cavalry, proposed by W. McLaren Smith, Esq., M. A., seconded by Captain J. Waterhouse.

- C. V. Marshall, Esq., Berhampore, Moorshedabad, proposed by J. Wood-Mason, Esq., seconded by Captain J. Waterhouse.
- Col. G. H. Saxton has intimated his desire to withdraw from the Society after the third quarter of the current year.

The President announced that Dr. Stoliczka having resigned the posts of Natural History Secretary and Member of Council on proceeding with the mission to Kashgar, the Council have appointed J. Wood-Mason, Esq., Natural History Secretary, and elected J. Westland, Esq., C. S., a Member of the Council, in place of Dr. Stoliczka.

The Secretary read the following extract of a letter from J. Beames, Esq., C. S.

"As some misapprehension seems to exist as to the nature of the task now being carried on in respect to Chand's poem, I beg to state as follows:

"I have undertaken merely to supervise the production of a printed text of Chand from a good and complete MS. I do not undertake to correct what seem to be errors in the MS., because when more is known about the poem, it may turn out that what we now think errors, are really correct.

"The object of the Society, I take it, is merely to put into the hands of scholars the poem itself as it stands. It is not now accessible to the public at large, because it is only in MS., but when it is in print, hundreds of scholars in various places can work at it, and their labours will, I hope, result eventually in a correct text. Many hundred years have clapsed since the text of Homer and Virgil were first put into print, yet scholars have not yet left off altering and improving the text. I think it would be almost dishonest in me to tamper with the text of the MS., by so doing I should perhaps mislead all future generations of scholars by giving currency to what my own imperfect knowledge deems right, instead of what the poet really wrote.

"The two points open to discussion at present are the division of the words and the metres.

"On the first of these points I would only say that the division I have made is not intended to be an ex-cathedrá declaration that I am right. It is merely a suggestion. In a large majority of cases there can be no doubt, in doubtful passages future scholars are at liberty to alter as they please. The question will probably be a debatable one for centuries to come.

"As to the metres, I could easily by doubling single letters, reducing double letters to single, and otherwise hocussing the text, bring the metres into accordance with the modern rules of Hindi prosody. But this I will not do, it is not fair. I put before the world the exact spelling of my MS., and scholars can manipulate it as they like. What the world wants, is not Prithiraja Raso by Beames, but Prithiraja Raso by Chand.

"Having thus clearly stated my 'platform,' I beg to retire from the controversy for which I have neither time nor taste. If critics like to pull the text to pieces, they can, it matters nothing to me. It is not I who wrote the poem, but Chand, I am a mere printer's devil putting what Chand wrote into type, and if scholars find fault with Chand, they may cudgel him to their heart's content, it is no affair of mine."

Also a letter from the Secretary to the Government of India, Foreign Department, conveying the thanks of the Viceroy and Governor-General in Council to the Society for their offer of cordial co-operation and assistance in furthering the Scientific objects of the Yarkand Mission, and stating that

H. E. in Council would be glad to be favoured with any further observations which might occur to the Council of the Society, as to the specific points to which the attention of the officers attached to the Mission should be directed.

In compliance with this request, the following memorandum has been drawn up by the Natural History and Physical Science Committees, and submitted to Government.

Memorandum of Subjects for Scientific Observation to which the attention of the Members of the Yarkand Mission may be particularly directed.

As the Council of the Society have not been informed of the strength and qualifications of the scientific party which has been, or will be, selected to accompany the Yarkand Mission, or of the routes they will follow, and the facilities available for carrying out those investigations which seem the most desirable, it is somewhat difficult to form an idea of the particular branches of science in which the members of the Mission will best be able to make observations, but without going into details they will endeavour to notice the principal points to which attention may most advantageously be directed.

ZOOLOGY AND BOTANY.—The knowledge of Zoology and Botany to be obtained from these regions will chiefly depend upon the facilities and assistance which the Naturalist of the Expedition will have in procuring and transporting Zoological and Botanical specimens. There can be no doubt that both, and particularly the former, will prove of great interest, not only for the study of our Indian fauna, but also as being intermediate between that of India and Siberia on the one hand, and that of the Mediterraneo-Caspian and the Northern Chinese and the Japanese on the other hand. It would be very interesting to notice whether any and which of the birds and also of the mammals which leave Siberia during the winter for the South, remain in the Trans-Himalayan valleys.

Such observations would greatly aid the study of the geographical distribution of animals. Reliable observations regarding the forms of animal and vegetable life at great altitudes will be of particular interest, and especially so on the Karakoram range, which is not only the true watershed between north and southern Asia, but virtually the average highest mountain range in the world.

If any limestone caverns be met with, they should be carefully searched, especially if of great extent, for any traces of the existence of a subterranean blind fauna such as has made the caves of Carniola in Europe, and of Kentucky in America, so famous. The position in the cave of such animals as may be found should be noted, so that the observations of Schiödte—that those animals nearest the mouth of the caves of Carniola were most nearly

allied to forms co-existing in the surrounding country, and had their eyes least affected of all, while of those that occupied the deepest recesses none had even representatives in the fauna of the country around, and all had their organs of vision completely aborted by disuse,—may receive corroboration.

GEOLOGY.—In Geology there is an immense field for observation. One of the principal tasks for the Geologist should be to construct a geological section across the Himalayan and Karakoram ranges, a section which would bear comparison with similar ones made across the Alps in Europe. It is needless to say that the officer entrusted with this work should be well acquainted with the geological structure of the Alps.

Collections of fossils made in these regions would materially aid in establishing a proper correlation between the geological formations of the Himalayas and those of the Alps. It is known from previous travellers that the large plain of Tibet was formerly inhabited by huge Pachyderms such as, Elephants, Mammoths, &c. similar to those which we find on this side of the Himalayas in the Scwalik deposits. As yet only stray fragments of these ancient relics have reached the scientific world, and an endeavour should be made not only to collect as many of these fossils as possible, but also to ascertain the age and stratigraphical relations of the deposits which contain them. Further, it is possible that the great Vienna and Hungarian Miocene basin, which gradually retreated towards the Caspian Sea as the centre, extended eastwards as far as the Pamir heights. Any information on the subject would prove of very great geological interest. We know on the one hand that the Eocene nummulitic deposits are found in Japan, while the southern parts of China, according to the recent explorations of Baron Richthofen, chiefly consist of crystalline and other rocks not younger than the Trias. It is possible that the Eocene Sea extended from Europe right through Central Asia to Japan. Geological data bearing on this subject should be recorded with particular care.

MINERALOGY.—Among useful minerals, Coal may be found, as it is believed that rocks of the carboniferous age have been brought from beyond the Karakoram. Again the Geological position of Jade, Turquoise, Amber, and other minerals brought from Trans-Himalayan regions, should as far as possible be ascertained. The Gold-washings should if possible be inspected.

PHYSICAL GEOGRAPHY.—The general physical features of a country are so intimately connected with its Geological Structure, that a Geologist ought to be able to do justice to them, if he co-operate with the Topographical Surveyor. Particular attention should be paid to the former extent and depth of the Central Asian lakes and water-basins, and their gradual diminution, because information on this subject will give us an idea of the former

greater richness of animal and vegetable life in those regions, and because it is intimately connected with evaporation. The existence and nature of saline deposits such as Borax, Salt, Carbonate of Soda, &c., should not be overlooked in connection with this subject. The extent, flow, and progress of glaciers should be noted.

The party should be supplied with the instruments necessary to make these observations, and also with a suitable instrument, by which the evaporating power of the air can be, at least approximately, determined at different elevations in the valleys and on large glaciers.

METEOROLOGY.—Whether Meteorological observations can be taken with any degree of fulness must depend greatly on the means of transport. If these do not admit of instruments being taken, other than such as are most compact and portable, it will be necessary to restrict the observations to the temperature and humidity of the air, to the direction and estimated force of the wind, the occurrence of rain, and the forms, quantity and movements of the clouds: but if the means of carriage suffice, a barometer, radiation-thermometer, an anemometer and an actinometer should be taken, and also a small rain-guage. The chief points to which attention should be given are the following:

- 1. The diurnal range of temperature in the shade; which may be expected to be very great in so dry a country. Care will be required in selecting a proper place for the thermometers to guard them from being affected by direct radiation to or from the clear sky.
- 2. The minimum temperature of radiation at night should be observed whenever possible by a thermometer placed on the ground, and fairly exposed to the sky. In taking these observations, it is necessary, if the ground is not level, to place the instrument in a slight hollow or on black woollen cloth in a shallow box, or it will be affected by the convection of the air, and show a temperature many degrees higher than one protected from this influence. It is probably greatly owing to this cause that the registered temperature of nocturnal radiation at certain of the Himalayan stations appears to be but little below that of a shaded thermometer.
- 3. Any observations of the absolute heating power of the sun will be very valuable, since the dryness of the air is such, that its absorption of solar heat must be small. At such times particular attention should be paid to the clearness of the atmosphere from dust, since if a dust haze prevails to any great height, the absorption of solar heat by the atmosphere may be very considerable. If the means of transport do not allow of an actinometer being taken (Hodgkinson's is the best) the maximum heat of the sun, taken by a black bulb thermometer in vacuo, will be valuable.
- 5. Observations of barometric pressure will probably be made for the determination of heights. If possible, a few sets of hourly observations ex-

tending from midnight to midnight should be taken, for showing the range and periods of the diurnal oscillation. At the Himalayan hill stations, the morning minimum is most frequently the absolute minimum of the day, which is far from being the case in the plains of India.

It will be interesting to see whether on the more elevated parts of the Himalaya and Trans-Himalayan plateaux, the oscillation follows the same law as on the Indian plains or that of the hill stations. Also how the epochs of maximum and minimum vary in the higher latitudes.

6. A register of the direction and (in the absence of an anemometer) the estimated force of the wind according to the Brunfort Scale, is specially important. Particular attention should be given to the direction in which the clouds drift.

It is stated by Mr. Shaw that in Eastern Turkistan, the wind is chiefly from the north up to the great mountain range, whereas it appears from Hooker's and others' observations, that to the south of Tibet it is from the south at all times of the year. It is scarcely necessary to say that among the mountains, the winds are greatly affected by the direction of the valleys, so that the movement of the clouds is the best criterion of that of the great air currents. But any observations on the local variations of the wind will be of interest. Its diurnal changes in the valleys and in the passes are worthy of special observation. The violent winds from the south which blow through the passes during the afternoon hours are described by many travellers, and are referred by General Strachey to the heating and rarefaction of the air over the lofty table-lands of the interior.

Night winds also blow down the valleys, which are probably streams of air cooled by radiation and gravitating like water down the hill slopes and beds of the valleys. Any observation on them, the time they set in, their duration and force, and the temperature of these winds will be important. Also their upper and lower limits.

7. The humidity of the air will necessarily be very low. It should be observed when actinometer observations are taken; and whenever hourly observations of the barometer are made, those of the hygrometer should be made also. Besides these, observations of the wet and dry bulb thermometer should be taken at other times as often as practicable. The movements of the clouds have already been referred to. Their quantity, forms, and estimated height at different seasons should also be attended to. These and the wind observations may be made at all times without the aid of instruments other than a compass.

MAGNETIC OBSERVATIONS.—The only attempt to procure Magnetic Observations in Thibet and Turkistan of which the Council are aware, was made in 1857 by the Brothers Schlagentweit, one of whom lost his life in the expedition. They only made a small number of observations and none

have since been attempted, so that the magnetic condition of the country north of the Himalayas may be looked upon as utterly unknown.

John A. Bourn who made a Magnetic Survey of part of Southern India in 1854 remarked in the year 1860, that the magnetic lines in India are so abnormal, and so discordant with the usual theory, that a thorough examination of the whole area about the Himalayas was strongly to be recommended. As the subject is one of extreme importance and as the opportunity now presented of making such observations is one which may not occur for some time, the Council would urge upon the attention of the Government, the desirability of taking advantage of it as far as may be practicable and would suggest that Col. Walker, the Superintendent of the G. T. Survey, should be consulted on the subject, and be asked, if he has not already done so, to make arrangements for the supply of such of the necessary instruments as may be available in India, and can be taken with the expedition.

If possible the intensity should be determined at a few places, but if the time at the disposal of the observer should not be sufficient for the determination of this, observations of the declination and dip at even a few points would be valuable.

GEOGRAPHY.—The appointment of an officer of the G. T. Survey, under the direction of Col. Walker, R. E., is a guarantee that the interests of geographical science will be furthered to the utmost possible extent, and considering that Col. Walker is most probably in possession of all available information regarding the geography of these regions, it seems unnecessary to the Council to enter into details on this subject beyond pointing out the desirability of making, if possible, an exploration in advance, North and East from Yarkand, towards Karashar.

ETHNOLOGY.—An endeavour should be made to ascertain whether any traces of a pre-historic race of man exist. Caves and sub-recent gravel deposits ought to be searched for any human or animal remains they may contain. Attention should be paid to the physical characteristics of the different races inhabiting the regions visited by the Mission, and any information as to their origin, migrations, language and dialects, the distinctive appellations of the tribes and their subdivisions would be valuable. In all cases when possible, measurements, and photographs showing the general appearance and costume, as well as the distinctive facial characteristics and shape of the heads of males and females of the different races and tribes, should be taken and carefully recorded.

HISTORY AND ANTIQUITIES.—It is unknown what historical records and ancient remains exist in Turkistan, but every opportunity should be taken of securing oral and written information, with copies of any inscriptions bearing on the history and antiquities of the countries visited by the Mission.

Endeavour should be made to obtain the following MSS-

- 1. Tárikh i Rashidi, by Mírzá Haidar Gúrgání. It is a history of Káshghar to the reign of 'Abdurrashíd, king of Káshghar (16th century), and contains interesting descriptions of Tibbet, Káshghar and Kashmír.
- 2. Tazkirah Maqim Kháni.—A history of the Uzbak Kháns of Transoxiana.
- 3. Any other history of the family of Chingiz Khán, especially of more modern date. For the history of Káshghar during the 17th, 18th and 19th centuries we have no work whatever.
- 4. A Tuzkirah, or history of the literature, of Káshghar and surrounding countries.
- Nasabnámahs, or genealogical works on the tribes in Kipchák,
 Bukhárá, Káshghar, and Mughulistán (Mongolia) in general.

A Collection of Coins, Plans, Photographs, and descriptions of Budhist and Muhammadan antiquities will also be very valuable.

Mr. H. Rivett-Carnac said that, as being a member who seldom had an opportunity of attending the meetings of the Society, he had some diffidence in making a suggestion. He quite thought with the President, that the members of the Mission had been so well selected, that there was little likelihood of anything of real interest escaping their attention. But as the Government of India had asked the Society for suggestions, and as suggestions had been made in some detail on one or two points, he (Mr. Rivett-Carnac) would ask that the members of the Mission might be requested to gather what information they could regarding any tumuli, or barrows they might pass on their journeys. It would be very interesting to learn how far these tumuli resembled, both in their construction and contents, those discovered in many parts of India, and it might perhaps hereafter be possible to trace, with the help of an unbroken chain of these remains, the inroads, at a very early date, of tribes from the centre of Asia into India.

The following papers were read:

Notes on Children found living with Wolves in the North Western Provinces and Oudh.—By V. Ball, Esq., B. A., Geological Survey of India.

(Abstract.)

The author after some prefatory remarks, gives the following extract from a letter he had received from the Revd. Mr. Erhardt, Superintendent of the Orphanage at Secundra, in reply to his request for information regarding a boy in that Institution, who was alleged to have been found living with wolves.

"We have had two such boys here, but I fancy you refer to the one who was brought to us on March 5th, 1872. He was found by Hindus, who had gene hunting wolves in the neighbourhood of Mynpúri. Had been burnt out of the den, and was brought here with the scars and wounds still on him. In his habits he was a perfect wild animal in every point of view. He drank like a dog, and liked a bone and raw meat better than anything else. He would never remain with the other boys, but hide away in any dark corner. Clothes he never would wear, but tore them up into fine shreds. He was only a few months among us as he got fever and gave up eating. We kept him for a time by artificial means but eventually he died.

"The other boy found among wolves is about thirteen or fourteen years old, and has been here almost six. He has learnt to make sounds, speak he cannot; but he freely expresses his anger and joy; work he will at times, a little; but he likes cating better. His civilisation has progressed so far that he likes raw meat less, though he still will pick up bones and sharpen his teeth on them.

"Neither of the above are new cases however. At the Lucknow Madhouse there was an elderly fellow only four years ago and may be alive now, who had been dug out of a wolves' den by a European doctor, when, I forgot, but it must be a good number of years ago.

"The facility with which they get along on four feet (hands and feet) is surprising. Before they eat or taste any food they smell it, and when they don't like the smell, they throw it away."

Mr. Ball then quotes the well-known story (vide Ann. and Mag. Nat. Hist., 1851 p. 163) of the capture of one of these wolf-reared children on the banks of the Gumpti, who was afterwards taken to Lucknow and who is in all probability the "elderly fellow in the Lucknow Mad-house" referred to in Mr. Erhardt's letter.

The writer then draws attention to a remarkable feature in all these stories, viz., that the wolves are invariably alleged to have communicated much of their natural ferocity and notably untamable disposition to their foster children, and attempts to account for their somewhat unwolf-like treatment of them.

The author, in conclusion, states that his object in putting forward this account, is to bring about a thorough investigation of a subject which, if these stories of wolf-reared children could be substantiated, must prove of considerable physiological interest and importance.

Mr. Blanford said he could not think the evidence adduced by any means satisfactory, and he would be glad could any one endowed with some amount of judicial scepticism, visit the Secundra Orphanage and ascertain. as far as possible on what kind of testimony, these accounts of wolf-children

really rested. He did not of course question that the Superintendent of the Secundra Orphanage wrote in good faith that which he really believed.

After some further discussion it was agreed, on the motion of the President, that the Secretary should write to the Superintendents of the Secundra Orphanage and the Lucknow Lunatic Asylum so as to obtain, if possible, further information on the subject.

2. Rude Stone Monuments in Chutiá Nágpúr.—By Col. E. T. Dalton, C. S. I., Commissioner of Chutiá Nágpúr.

(Abstract.)

Col. Dalton describes in this paper the sepulchral and monumental stones of the Kols. He first mentions those which he saw in the Saranda Pir (Singhbhúm District), the inhabitants of which are of the Munda type of Kols, who, to judge from their Mongolian features, are a very primitive race. The author also gives a sketch of the great Munda burial ground of Chokahatu, 'the place of mourning,' in Lohárdaggá District, where he counted 7,360 tombs, mostly of the dolmen or cromlech form, all close together, covering an area of seven statute acres. The horizontal slabs of the tombs are generally huge masses of gneiss, often exceeding 15 feet in length and 4 feet in breadth.

The monumental stones are less in number than the sepulchral, and they resemble in many details the Kasia cenotaphs described by Col. Yule.

Photographs of the Chokahatu Burial Ground and sketches of monumental stones accompany the paper.

Mr. Blanford said, any one acquainted with the monuments of the Khasia Hills must be at once struck with the many points of resemblance between them and those, sketches of which accompany Col. Dalton's paper. The most important point to be noticed is the association of the upright stone, the menhir with the low flat dolmen in front; an association which is invariable on the Khasi Hills, and, according to Major Godwin-Austen's account, has not received any other explanation than that of custom. He says "The tall upright stones are called Mao bynna, from mao, a stone. bunna to make known, literally 'a monument.' They are also known by the term Mao shinran, the male stone, while the flat scat-like slab in front, is called Mao Kynthai the female stone, representative of all life, being in pairs. My informant explained this, by saying the monument would be imperfect without the flat stone or its female adjunct." The similarity of the arrangement, combined with the fact that the Mundas are stated by Col. Dalton to have a decided Mongol physiognomy, is very remarkable, and sugrests a closer connection than usual between two tribes now separated by the whole extent of the plains of Bengal.

On the other hand, certain important differences must not be overlooked. First in the number of the *Menhirs*. Col. Dalton's sketches exhibit a single menhir to each dolmen. This the speaker believed is never the case on the Khasi Hills. The number is never less than three, and the greatest number noticed by Major-Godwin Austen is eleven, the number being, however always odd. Again, it appears from Col. Dalton's account, that the Munda stones are sepulchral monuments. This is not the case on the Khasi Hills, at all events now. They are there of a votive character and have no connection with funeral customs. A person who is ill or who desires the assistance or protection of an ancestor, vows a certain number of stones, if he recovers from his illness, or if the ancestor proves propitious. The ancestor who is supposed to have power in the case in question, is discovered by the breaking of eggs or other means of divination, and sometimes when the favours are prolonged and repeated, additional stones are set up, in acknowledgement of the benefits received.

Col. Dalton does not refer to Major Godwin-Austen's account and may not have seen the original, but he is probably acquainted with it as it is quoted in Fergusson's 'Stone Monuments' of which he speaks in his paper. The original, published in the Journal of the Anthropological Institute is the most complete description the speaker had seen of the stone monuments of the Khasi Hills. If Col. Dalton should have any further opportunity of examining the Munda monuments, it would be of interest to ascertain whether there is no instance of a multiple arrangement of the menhirs, and whether they are ever set up as votive memorials. His account seems to leave no doubt as to the sepulchral character of those he describes.

Mr. H. Rivett-Carnae submitted that the paper, with its illustrations, contributed by Colonel Dalton was of the greatest interest, as giving another case of a tribe, living in an unfrequented hill-country, which appeared to have practised from time immemorial, and still to continue to practise, a system of creeting monuments over their dead, similar to the pre-historic remains observed in the hill-country, and comparatively inaccessible tracts of other parts of India. In the basalt, or trap country, where boulders of trap only could be obtained, the tumuli took the form of barrows, or circular mounds surrounded with boulders. When the sandstone formation was reached, where it was not difficult to split the block of stone into slabs, burying places somewhat similar to these shewn by Colonel Dalton, took the place of the barrows. These had been figured, and described by Colonel Meadows Taylor, C. S. I. and other members of the Society, and he (Mr. Rivett-Carnac) had had the honor of bringing the subject of some of the tumuli in Central India to the notice of the Society.

His chief interest in these tumuli and their contents was their striking resemblance (pointed out by Colonel Taylor) to those that existed in many

parts of Europe. During his recent visit home, he (Mr. Rivett-Carnac) had had an opportunity of visiting the excellent Prehistoric Museum presented to the town of Salisbury by Messrs. Blackmore and Stevens, and he had been much struck with the great similarity between the remains dug out of the barrows of Central India, (which had been exhibited to the Society) and those discovered in the English Barrows.

As in Europe so in India, these tumuli were generally to be found in what, for a long time, at least, must have been very inaccessible parts of the country. The tribes in India who kept up the old customs were, so far as he could understand, quite a different race from their neighbours of the plains, and the view seemed to be generally accepted that these hill-men were all that now remained of the tribes found in India by the Aryans on their taking possession of the country. Future enquiries, and discoveries might, perhaps, establish the view which had been suggested in many quarters, that the builders of the tumuli in Europe and Asia were originally of the same Central Asian stock, one portion of which, in ages past had marched westward, another moving southward towards India. As time went on other, other and more powerful hordes, following the same routes taken by their predecessors several centuries before, drove into the woods and fastnesses these so-called aboriginal tribes, whose common origin is suggested by the similarity in the monumental remains found in many parts of Northern Europe, and also in Central and Southern India, and among the hills inhabited by the tribes of which Colonel Dalton had given the Society so interesting a description.

Dr. Anderson remarked that the fact mentioned by Col. Dalton that the Mundás of Chutiá Nágpúr exhibit distinct traces of a Mongolian origin in the style of their features was one of great interest. Many years ago, Mr. Logan had pointed out, and more recently Sir George Campbell, that there is a similarity between the language of the aboriginal tribes of Chutiá Nágpúr and the language of the Burmo-Malayan people. In connection with this subject, there is an interesting commentary, or verification of Col. Dalton's statement regarding the Mongolian affinity of the Kolarians, to be found in the last number of the Philological Section of the Asiatic Society's Journal. There Sir A. Phayre points out that the first syllable of the word Mundá which is the word used to designate the language of several tribes of the western highlands of Bengal, is identical with the race name of the people of Pegu, and he is of opinion that the Mun or Talaing people of Pegu are of the same stock as the Kols. Thus these two authorities arrive at the same conclusion independently of each other and by two widely different methods.

The word Muang which is of such frequent occurrence in Western Yunan, and along both banks of the Cambodia, would seem to be the same as the Pegu Mun, for it means a district or country. In all probability, it was first applied to the aboriginal people of these parts, but as they gradually disappeared before the conquerors, or were absorbed by them, it was eventually transferred to the country which they had inhabited, or was restricted to districts in which they had been originally in great force. We thus find in Yunan Mungla, which would appear to be identical with the Kolarian Mundá.

Col. Mainwaring said-

I have been requested to say a few words with regard to a remark made by Sir Arthur Phayre in his interesting narrative 'On the History of Pegu" which appeared in the last number of the Asiatic Society's Journal. In alluding to the inhabitants of Pegu, who, Sir A. Phayre says, are called " Mun, Mwon or Mòn," he refers to Csoma de Körös' Tibetan Dictionary for the definition of the word, there rendered,-a general name for all the people between Tibet and the plains of India,-by which Sir A. Phayre infers, that the inhabitants of Pegu may have originally emigrated from the Hills near Tibet. Csoma De Körös, when inscribing the aforequoted passage in his Dictionary, must have been mistaken or must have written vaguely: for of course there are numerous tribes who inhabit the hills between Tibet and the plains of India, and to all of these, the term Mon is certainly not applied by the Tibetans. The appellation may have formerly been, or may still be, given to other races, but in Sikim and the neighbouring countries north and east, the Tibetans apply the term Mon alone to the Lenchas. None of the other races are so denominated; for instance the race, Europeans call Butia, (which literally means 'a Tibetan,' from 45 Bod. Tibet), they distinguish by the name of Hlo-pa, literally Southerners; the Nepalese they call 'Bal po' (from 42'4'29 Bal po yúl, the country of wool), &c. It might therefore be considered probable that the inhabitants of Pegu and the Lepchas might have originated from one source. The physical conformation and features of the Mon of Pegu, as represented by Sir A. Phayre, certainly correspond to that of the Lepcha; he describes them as short, stout and fair, especially the Karen tribes, who when young, "are not darker than southern Europeans." The great criterion, however, the language, tends to prove that no affinity exists between them. From testwords in the Mon language of Pegu, taken from Dalton's Ethnology, I can find no analogy between that language and the Lepcha tongue. Sir A. Phayre ascribes the fairness of complexion that exists among the Pegu race, to local causes. I should certainly not assume the same cause for that of the Lepchas, whom I have often seen, especially in former days, quite as fair as Europeans: that they must have emigrated, at some early period, from beyond the Himalayas, is undoubted; a people and language, so noble and perfect such as existed under the name of Rong, (by Europeans designated

Lepchas), when Darjíling was first established, could never have been generated in the wilds and isolation of the Himalayas, the body of the people may still exist, and may, perhaps, yet be discovered, probably in the north of China about Mongolia or Manchuria.

The receipt of the following communications was announced—

- 1. On a new species of Kite. By A. Anderson, Esq., with a note by W. E. Brooks, Esq., C. E.
- 2. Rude Stone Monuments in Chutia Nagpur. By Col. E. T. Dalton C. S. I.

LIBRARY.

The following additions have been made to the Library since the meeting held in May last.

Presentations.

** Names of Donors in Capitals.

Bulletin, Mars 1873.

Col. H. Yule.—L'orographie et le system des eaux du Pamir. (Extract from the author's essay in Wood's "Sources of the Oxus"). N. de Khanikof.—Les documents sur le Khanate de Khiva. (An abstract of the sources of information available regarding the Khanate of Khiva). Vivien de St. Martin.—Voyage d'exploration en Indo-Chine. L'Abbé Desgodins.—Végétation des sommets au Nord de Yerkalo. Hauteurs entre Yerkalo et Bathang. (The first of these papers also contains some meteorological observations taken on the range separating the Lan-tsang Kiang from the Kin-cha-Kiang near Yerkalo.)

THE GEOGRAPHICAL SOCIETY OF PARIS.

K. Preussischen Akademie der Wissenschaften zu Berlin. Monatsbericht, December, 1872.

Poggendorff,—Beitrag zur näheren Kenntniss der Elektromaschine (Zweiter Art).

Peters,—Uber Hydrus fasciatus, Schneider, und einige andere Seeschlangen. Hagen,—
Beobschtungen über die Bewegung der Luft und des Wassers.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN.
Institution of Mechanical Engineers, Proceedings, Oct. 1872.

A. Morton,—On the ejector condenser for steam engines, dispensing with an air pump. A. C. Hill.—On the working of the improved Compound Cylinder Blowing Engines and Howard Boilers at the Lackenby Iron Works, Middlesbrough. Colonel Clay,—On an improved construction of Tool for Turning metals at increased speed.

THE INSTITUTION OF MECHANICAL ENGINEERS, BIRMINGHAM. Bengal Social Science Association, Transactions, Vol. VI.

Address by the President. The Hon. J. B. Phear.—On some features of Litigation in Bengal. W. Clarke.—On Tied Arches. The Rev. J. Long.—Village communities in India and Bussia. Mr. J. Geoghegan.—Indian Cooley Emigration. Peary Mohun Mookherjee.—Agriculture in Bengal.

THE BENGAL SOCIAL SCIENCE ASSOCIATION.

Geological Survey of India.

Memoirs, Vol. X, pt. I.

R. B. Foote, -Geology of Madras. H. B. Medlicott. -Sátpura Coal Basin.

Palæontologia Indica, Vol. IV. Pt. 4 Cretaceous Fauna of Southeren India.

Dr. F. Stoliczka. The Corals or Anthozoa, &c.

Records, Vol. VI. pt. 2.

V. Ball.—The Bisrampur Coal-field. F. R. Mallet.—Mineralogical Notes on the Gnoiss of South Mirzapur and adjoining country.

THE SUPERINTENDENT OF THE GEOLOGICAL SURVEY OF INDIA. Sketch Map of the Countries between Hindustan and the Caspian Sea April 1873.

THE SURVEYOR GENERAL OF INDIA.

Indian Museum.

Minutes of the Trustees, from Sept. 1866 to March 1872.

TRUSTEES OF THE INDIAN MUSEUM.

Martyn's Universal Conchology, 2 Vols.

Dr. F. STOLICZKA.

Report of the Sanitary Commissioner for Bengal for 1871, by Ch. J. Jackson, M. D.—Report on the Administration of the Registration Department in Bengal for 1871-72, by H. Beverley.—Report on the Administration of the Salt Department for 1871-72.

THE GOVERNMENT OF BENGAL.

Exchange.

Nature, Nos. 180-183.

Purchase.

Pratna-kamra-Nandini, Vol. VI. No. 1.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the month of May 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent thereon.

20. (an Height of te Barometer 32° Faht.	Range of the Barometer during the day.			Mean Dry Bulb Thermonieter.	Range of the Tempera- ture during the day.		
Date.	Mean Height the Baromete at 32° Faht.	Max.	Min.	Dia.	Mcan I Therm	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	0	0
1	29.662	29.737	29,553	0.184	82.7	93.0	75 5	17.5
9	.611	.697	.579	.118	83.7	92.4	76 0	
	.668	.735	.579	.156	81.0	94.7	72.2	22.5
4	.771	.83.3	.723	.110	75.6	90.5	71.0	19 5
5	.839	.927	.770	.157	79.1	88 0	71.0	17 0
в	.864	.933	.785	.148	79.6	88.7	710	17.7
7	.842	.918	.776	.142	83.4	92 ()	75 3	16.7
8	.816	,900	.731	.169	85.5	910	80.1	13.9
. 9	818	.880	.755	.125	86. 5	96.0	80.0	16.0
10	.814 .727	.884 .805	.738	.116	87.6 88.7	97.3 99.5	80.0	17.3
11	.682	.752	.649	.156 .150	88.8	100.1	80,0 81.5	19.5
$\frac{12}{13}$.730	.798	.60 2 .660	.138	87.2	94.8	80.4	18.6 14.4
1.3	.744	.810	.689	.121	89.3	100.2	80.5	19.7
15	.742	.818	.669	.149	89.9	100.0	81.8	18.2
16	.734	.810	.656	.154	90.3	100 5	82.0	18.5
17	.698	.769	.651	.118	91.1	101.7	82.6	19.1
18	.697	.756	.650	.106	91.4	103 0	83.2	19.8
19	.687	.756	.613	.143	92.0	104.2	83.0	21.2
20	.669	.734	.607	.127	92.1	104.5	83.3	21.2
21	.627	.691	.543	.148	92.3	106.0	83.5	22.5
22	.592	.651	.514	.137	91.4	104.0	83.2	20.8
23	.574	.650	.495	.155	89.8	99.0	82.0	17.0
21	.646	.702	.583	.119	87.3	97.0	76.5	20.5
25	.676	.#31	.584	.147	86.6	98 8	77.0	21.8
26	.666	.725	.589	.136	87.5	96 5	79.0	17.5
27	.677	.751	.610	.141	83 7	91.5 88.5	79.4 78.9	12.1 9.6
28	.608	.673	.537	.136	82.1	91.5	79.5	9.0 12.0
29	.524	.589	. 130	.159	81.1 81.3	91.3	80.0	11.3
30	.467	.515	.392	.131	80.0	93.7	81.3	12.4
31	.442	.505	.37 1	.101	00.0	20.1	٠٥	

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcultu, in the month of May 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon. -(Continued.)

			Penneno			,		
Date	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Pomt.	Mean Elastic force of vapour.	MeanWeight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	0	0	0	0	Inches.	T. gr.	T. gr.	
123456789111231456711231456711232423422342562788931	78.4 79.4 79.2 72.9 74.3 76.7 79.4 79.7 80.0 80.0 77.4 80.0 80.9 79.1 81.7 82.3 83.6 82.2 78.9 78.2 78.9 80.0 78.8 79.5 79.7 80.3	4 3 4 8 2.7 4 6 5.7 6.1 6.8 6.7 6.8 9.8 9.2 7.9 10.4 10.0 7.6 8.4 8.6 3.7 3.6 4.9 4.6 5.7	75.4 76.4 77.6 71.0 71.0 72.0 75.1 75.6 74.7 71.6 77.3 71.9 71.9 75.9 77.6 78.9 77.4 76.1 76.3 76.1 76.3	7.3 7.3 8.2 4.6 7.8 9.0 11.4 10.4 11.0 13.9 14.1 15.7 12.6 15.0 19.2 19.5 17.4 16.6 16.0 12.5 12.2 13.4 13.8 6.3 6.1 8.9 7.8	0.865 .893 .876 .751 .758 .741 .776 .857 .871 .899 .819 .843 .919 .862 .773 .773 .843 .868 .890 .967 .928 .824 .806 .819 .922 .890 .885 .890 .890 .890 .890	9 30 .58 .39 8.17 .20 .00 .31 9.15 .27 .56 .00 8.97 .11 .92 9.72 .12 8.16 .14 .89 9.14 .89 9.14 .89 9.14 .89 9.14 .89 9.83 8.78 .59 .71 9.80 .71 9.80 9.80 9.	2.42 .49 .78 1.31 2.33 .69 3.65 .57 .83 .96 4.96 5.03 .29 4.74 5.51 6.81 .96 .47 .27 .12 4.90 .59 .63 .55 .78 2.18 .04 .83 .69 .69 .69 .69 .69 .69 .69 .69 .69 .69	0.79 .77 .86 .78 .75 .70 .72 .71 .65 .64 .61 .62 .55 .58 .60 .68 .68 .68 .68 .68 .68 .68 .77 .78

[.] All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	Mean Height of the Barometer at 32° Faht.	Range of the Barometer for each hour during the month.			fean Dry Bulb Thermometer.	Range of the Tempera- ture for each hour during the month.		
Hour.	Mean H the Barc 32°]	Max.	Min.	Diff.	Mean Dry Thermome	Max.	Min.	Diff.
3 4: 3	Inches.	Inches.	Inches.	Inches.	o	o	0	0
Mid-night. 1 2 3 4 5 6 7 8 9 10 11	29.701 .691 .680 .670 .671 .685 .699 .720 .737 .748 .748	29.033 .874 .854 .840 .824 .864 .864 .883 .912 .918 .917 .927	29.478 .468 .457 .446 .434 .445 .463 .479 .496 .505 .491	0.455 .406 .397 .394 .390 .421 .401 .401 .416 .413 .426	81.6 81.3 80.9 80.6 80.2 80.1 80.2 81.4 84.2 87.4 90.2 91.8	86.5 86.0 85.3 84.6 83.8 83.6 83.5 85.2 88.5 92.0 95.6 98.6	71.6 71.3 71.2 71.0 71.0 71.0 72.0 76.7 79.7 82.4 84.0	14.9 14.7 14.1 13.6 12.8 12.5 13.2 11.8 12.3 13.2 14.6
Noon. 1 2 3 4 5 6 7 8 9 10 11	.720 .701 .674 .651 .631 .620 .632 .617 .688 .699	.916 .893 .866 .835 .809 .796 .788 .807 .832 .860 .900	.452 .431 .405 .886 .374 .392 .391 .407 .418 .423 .414 .440	.464 .462 .461 .449 .435 .404 .394 .400 .414 .437 .456 .487	93.2 94.2 94.9 95.3 94.8 93.3 90.3 87.3 85.6 84.2 82.8 82.3	101.2 104.0 104.5 106.0 106.0 103.9 100.7 96.0 92.0 89.8 87.6 86.8	79.4 74.0 71.0 71.6 71.5 71.0 71.0 71.0 72.0 72.1 71.0	21.8 30.0 33.5 34.4 34.5 32.9 29.7 25.0 17.8 15.8

The Mean Height of the Baremeter, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculla, in the month of May 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

Hour	Bulb Th	2	Dew P.	b above Dew		ean Weight of Vapon n a Cubic root of air.	d for	
	a a	y Bulb		ą.		ean Wei n a Cubi	iţi o jū.	
Mid-					Inches.	T. gr.	T. gr.	
night. 1 2 3 4 5 6 7 8 9 10	78 5 78 2 78 2 78 0 77 9 78 1 78 8 79.7 80 6 81 0 81.0	3.1 2.8 2.7 2.6 2.3 2.1 2.6 4.5 6.8 9.2 10.8	76.8 76.5 76.3 76.2 76.4 76.6 77.0 76.5 76.5 74.5	5.3 4.8 4.6 1.4 3.9 3.7 3.6 4.4 7.7 10 9 11 7 17.3	0.890 .896 .890 .887 .890 .893 .899 .910 .896 .896 .868	9.59 .65 .58 .61 .64 .69 .81 .59 .54 .18	1.75 .59 .51 .43 .27 .20 .19 .46 .65 .91 .41	0.85 .86 .86 .87 .89 .87 .78 .71 .63
Noon 2 3 4 5 6 7 8 9 10	80.7 79.9 79.4 79.9 79.6 80.4 80.1 79.6 78.7 78.9 78.7	12 5 11 3 15 5 15.4 15.2 12 9 10.2 7.4 6 0 5 5 3.9 3.6	73.2 71.3 70.1 70.7 70.5 72.7 71.0 75.5 75.4 74.8 76.2	20.0 22.9 21.8 21.6 21.3 20.6 16.3 11.8 10.2 9.4 6.6 6.1	.806 .758 .729 .741 .739 .792 .827 .868 .865 .819 .887	.47 7.95 .61 .78 .71 8.32 .75 9.23 .24 .09	7:43 8.41 9.05 .11 8 91 7.63 5.88 4.18 2.52 .15 2.23	.53 .49 .46 .46 .47 .52 .60 .69 .72 .74 .81

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1873.

Solar Radiation, Weather, &c.

W....

ا ده دو ا

	. 48	Winn		
	Sole tion ann Guag ft. abox Ground.	Prevailing direction.		General aspect of the Sky.
1	o Inches 140.8 0.35	S by W, S&SI	lb Mile E¦ 9.6 175.0	S to 3 A. M., B to 7 A. M., i to 1 P. M., i to 4 P. M., i to 7 P. M. High wind from 4½ to 6½ P. M. T at 6 P. M.
2	142.5	SE&S	0.4 216.6	B. between 5 & 6 P. M. B to 4 A. M., ito 9 A. M., ito 12 A. M., ito 3 P. M., S to 9 P. M. B to 11 P. M. T at 5 P. M.,
8	143.0 0.66	SSW&S	10.3 250.6	L from 7½ to 9 P. M. S to 7 A. M., \(^1\) to 5 P. M., O to 8 P. M., S to 11 P. M. High wind from 6 to 6½ P. M., T from 5½ to 7 P. M., L from 6 to 10
4	137.0 0.94	Variable	25.0 222.6	P. M. R between 5 & 6 and at 8 P. M.
5	136.0 0.60	Variable	5.2 228.2	wind between 10 & 11 P. M. T & L from 1 to 11 P. M. R from 1 to 6 & at 8 P. M. O to 7 A. M., \sigmai to 11 A. M., \sigmai to 8 P. M. High wind from 9 to 10\frac{1}{2} P.M. L from 7 to 11 P. M. T & R between
6	134.8 0.27	. Variable	165.3	9 ¹ to 11 P. M.
7	138.8	s w & w s w	107.0	Slight R from midnight to 2 a.m. S to 3 a.m., i to 7 a.m., i to 11 a.m. B to 11 p.m.
8	142.0	S W & S		i to 7 A. M., i to 1 P. M.
9	139.0	S & S W	164.6	11 p. m. B to 4 a. m., \i to 6 a. m. B to 1 p. m., \i to 11 p. m.

[\]i Cirri,—i Strati, ^i Cumuli, \i Cirro-strati, ^i Cumulo-strati, \i Nimib, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1873.

Solar Radiation, Weather, &c.

•	lar n.	nge ove	Win	D.		
Date.	Max. Solar radiation.	Rain Guage 11/2 ft. above Ground.	Prevailing direction.	Max.	Daily Velority.	General aspect of the Sky.
10	0 143.0	Inches	swawsw	lb 	Mile. 191.0	B to 4 A. M., Li to 6 A. M.,
11	145.8		S W & Variable		166.8	i to 9 p. m., i to 11 p. m. i to 6 a. m. B to 1 p. m., i to 6 p. m. B to 9 p. m., i
12	146.0		S & Variable	2.8	175.6	to 11 P. M. i to 11 A. M., i to 2 P. M., i to 5 P. M. O to 8 P. M., i to 11 P. M. Brisk wind between 7
13	146.0		WN W&Variable		153.9	& 7½ p. m. T & L from 6½ to 8 p. m. D between 7 & 8 p. m. i & i to 4 a. m. S to 7 a. m., i to 8 p. m. B to 11 p. m.
14	147.5	'''	wsw		152.1	i to 4 A. M. B to 12 A. M., ai
15	144.2		S&S W		159.6	to 6 p. m., \i to 11 p. m. B to 2 p. m., \cap i to 8 p. m. B 11 p. m. Tat 5 p. m. L on N at
	143.7 148.3		S W & Variable Variable	0.2	145.1 129.6	8. p. m. \(\) to 8 a. m. B to 11 p. m. B to 6 a. m., \(\) i to 9 a. m.
19	146.5 151.2 150.5		W by N S W & W by S W & S S W	•	124.9 139.9 138.9	B to 11 p. m. B. B. S to 1 a. m. B to 11 p. m.
	150.0 150.2		SW&WSW]	182.7 207.0	В.
	142.7	:::	ssw	2.0	306.0	Chiefly B. B to 7 P.M., clouds of different kinds to 11 P.M. Brisk wind from 12 A.M. to 5 & 11 to 11 &
24	143.0		SSW & S by E	11.0	401.3	N. M. L from 8½ to 10 p. m. O to 2 a. m., \ini to 8 a. m., Scuds to 11 a. m., \ini to 8 p. m. O to 11 p. m. Strong wind from 1½ to 12 p. m. L from 8 to 11 P. M. Dat 8½ p. m.

i Cirri,—i Strati, ^i Cumuli, Li Cirro-strati, Li Cumulo-strati, Li Nimbi, Li Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, Sin the month of May 1873.

Solar Radiation, Weather, &c.,

	olar on.	Guage above und.	Wind.			
Date.	Max. Solar radiation.	ham Gua	Prevailing direction.	Max. Pressure	Daily Velocity.	General aspect of the Sky.
1	0 145.0	Inches	Variable	4.0	239.2	O to 2 A. M., B to 4 A. M., ito 10 A. M., ito 4 P. M., ito 8 P.M. S to 11 P.M. Brisk wind from midnight to 0; A. M. L at midnight & 1 A. M. and from 8 to 11 P. M.
26	144.7		s s w	1.0	280.4	O to 5 A. M., I to 8 A. M., i to 6 P. M. B to 11 P. M. T at 4 P. M. L from midnight to 2 A.M. Dat 12\frac{1}{2} A. M. & 4\frac{1}{3} P. M.
	106.0	0.82	S by W & S	5.0	182.4	B to 6 A. M., oi to 10 A. M. O to 2 P. M. S to 4 P. M., oi to 6 P. M. B to 11 P. M. High wind from 11 to 11½ A. M. T from 10½ A. M. to 1 P. M. R at 8 and from 11 to 12½ A. M.
28	136.5	0.06 •	S&S by W	1.4	124.0	
2 9	140.0	•••	S by W &E N E	0.2	133.8	S to 5 A. M., i to 7 A. M., i to 2 P.M. i to 7 P.M. S to 11 P.M.
3 0	140.5	0.03	ENE&NE	0.4	154.0	O to 7 A. M., i & i to 7° P. M., i to 9 P. M. B to 11 P. M. Light R at 10\frac{1}{2} A. M. & 1\frac{1}{2} P. M.
31	141.7	0.05	NE&E by N	1.2	218.2	S to 6 A. M., i to 4 P. M., clouds of different kinds to 11 P. M. Slight R at 5 P. M.

i Cirri —i Strati, i Cumuli, i Cirro-strati, i Cumulo-strati i Cimbi, i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, B rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of May 1873.

MONTHLY RESULTS.

]	Inches.
Mean height of the Barometer for the month	•••		29 689
Max. height of the Barometer occurred at Midnight on			29.933
Min. height of the Barometer occurred at 4 P. M. on the			29 374
Extreme range of the Barometer during the month	. 0150		0.559
31 0 11 1 35 31	•••		29.756
This like Nim dist.	•••		29.616
Mean daily range of the Barometer during the month	•••		~
Mean addy range of the Darometer during the month	•••	•••	0.140
Conference			
			0
Mean Dry Bulb Thermometer for the month	•••		86.6
Max. Temperature occurred at 3 & 4 P. M. on the 21st		•••	106 0
Min. Temperature occurred at 6 A. M, on the 5th	•••	•••	710
Extreme range of the Temperature during the month	•••	•••	35.0
Mean of the daily Max. Temperature	•••		96 5
Ditto ditto Min. ditto,		:	79.5
Mean daily range of the Temperature during the month		•••	17.4
22can and 7 anyo of the rempetature during the month	•••	•••	17.3
With the state of			
Mean Wet Bulb Thermometer for the month	•••	***	79.3
Mean Dry Bulb Thermometer above Mean Wet Bulb The	rmomete	er	7.3
Computed Mean Dew-point for the month	•••		74.9
Mean Dry Bulb Thermometer above computed mean Dew	r-point	•••	11.7
	•		•
		L	nches.
Mean Elastic force of Vapour for the month	•••		0.851
-			
-			
•		Tuo-	!
NE		roy	grain.
Mean Weight of Vapour for the month	•••	•••	9.06
Additional Weight of Vapour required for complete satu	ration	•••	4.08
Mean degree of humidity for the month, complete saturation	n being t	mity	0.69
			_
Man Man Salan rediction Thermometer for the month			0
Mean Max. Solar radiation Thermometer for the month	•••	•••	142.2
		In	ches.
Rained 12 days,-Max. fall of rain during 24 hours!			0.94
Total amount of rain during the month		•••	3.78
Total amount of rain indicated by the Gauge* attached to	ilin ana	•••	9.19
	the ane	по-	9 99
	å" 1 117 ▲		3.28
Prevailing direction of the Wind	s. w a	. D. D). Y Y .
•			

[•] Height 70 feet 10 inches above ground.

Abstract of the Besults of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of May 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour. when any particular wind was blowing, it rained.

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- 1	.no ninst	- · · · - · -
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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR JULY, 1873.

A meeting of the Asiatic Society of Bengal was held on Wednesday, the 2nd instant, at 9 o'clock P. M.

Col. H. Hyde, R. E., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen duly proposed and seconded at the last meeting were balloted for, and elected ordinary members—

H. M. Durand, Esq., C. S.

Captain E. A. Fraser, 3rd M. L. C.

C. W. Marshall, Esq.

The following are candidates for ballot at the next meeting-

J. C. Parker, Esq., Calcutta, proposed by J. Wood-Mason, Esq., seconded by Capt. J. Waterhouse.

W. J. Olpherts, Esq., proposed by Walter Bourne, Esq., seconded by W. E. Brooks, Esq., C. E.

Lieut. C. T. Bingham, Bengal Staff Corps, proposed by Lieut.-Col. J. Y. Gowan, seconded by Capt. J. Waterhouse.

Kumára Grischandra Sinha Bahádur, proposed by Bábú Rájendralála Mitra, seconded by Col. H. Hyde, R. E.

Bábu Jogeslichandra Dutt, proposed by Bábu Rájendralála Mitra, seconded by H. Blochmann, Esq., M. A.

Alexander Pedler, Esq., proposed by H. F. Blanford, Esq., seconded by H. B. Medlicott, Esq.

Col. W. E. Marshall, Bengal Staff Corps, D. P. W., Fyzabad, proposed by J. Ewart, Esq., M. D., seconded by Capt. J. Waterhouse.

W. G. Bligh, Esq., Asst. Engineer, Agra Canal, proposed by F. S. Growsc, Esq., M. A., C. S., seconded by H. Blochmann, Esq.

Capt. W. F. Badgley, B. S. C., Deputy Superintendent Topographical Survey, proposed by Major H. H. Godwin-Austen, seconded by Capt. J. Waterhouse.

Lieut. R. G. Woodthorpe, R. E., Assistant Superintendent Topographical Survey, proposed by Major H. H. Godwin-Austen, seconded by Capt. J. Waterhouse.

The President announced that the Council have nominated Col. J. E. Gastrell as a Trustee of the Indian Museum, on behalf of the Society, in place of Dr. Stoliczka.

Mr. H. B. Medlicott exhibited a stone implement from the Ossiferous "Pliocene" deposits of the Narbadá valley.

Mr. Medlicott invited attention to the perfectly regular, pointed oval, form of the celt as proving it to be unquestionably manufactured. On the important point of geological position, it is equally satisfactory, having been dug by Mr. Hacket of the Geological Survey, out of the stiff clay on the bank of the Narbadá near Bhutrá, north of Gadarwara. Some twenty feet of ossiferous gravel rested on the clay; the whole being about one hundred feet below the present surface-level of the deposits. Dr. Falconer from first to last applies the term Pliocene to these beds and to their mammalian fossils, and with the conviction that human remains would be found in them.

Mr. Medlicott drew attention to the immense antiquity implied by the name Pliocene; and proved from Dr. Falconer's own writings that it had been knowingly applied by him, quite independently of its fixed meaning in the scale of geological formatious, and simply as expressing for the mammalian fauna that approximation to existing forms by which relation, as applied to the molluscan fauna, the name was intended, and is universally used, to indicate the youngest Tertiary formations. Dr. Falconer pointedly noted the great distinctions of the old Narbadá fauna from that of the Siváliks, and its strong affinities with existing forms; nowhere insisting upon it as specifically Pliocene.

Mr. Medlicott further pointed out from purely geological considerations that no such antiquity could be assigned to the old alluvium of the Indian rivers; that he could not regard them as older than the late Pleistocene or Quaternary, i. e. on about the horizon of the implement-bearing gravels of the river-valleys of northern Europe.

Mr. Blochmann exhibited several rubbings and tracings of inscriptions received from Jaunpur, Pánipat, and Muzaffarnagar, the former from General Cunningham, the latter from Mr. J. G. Delmerick, Dihlí, and Mr. A. Cadell, Ç. S. He said—

At the January meeting of the Society I exhibited a large number of Bengal inscriptions received from General Cunningham, and I now propose to exhibit, at this and subsequent meetings, his inscriptions from various places in the North-Western Provinces. I shall commence with the five inscriptions of the bridge over the Gumtí at Jaunpúr. The bridge was built in 975 (or 975-76) A. H., or A. D. 1567-1568, by a Kábulí architect (uetád) of the name of Afzal 'Alí, at the cost of Mun'im KhánKhánán.* In the existing gazetteers, it is stated on the authority of the Jaunpurnamak that the builder is Fahim, a freed man of Mun'im Khán; but we know from history that Fahím was a slave of Mun'im's successor, Mírzá 'Abdurrahím KhánKhánán (Kín translation, p. 338).

خان خانان منعم عالم مدار * بست این پل را بتوفیق کریم نام او منعمازان آمد که هست ، بر خلایق هم کریم و هم رحیم از صراط مستقيمش ظاهر است . شاه راهم سوى جنات النعيم رو بقاریخش بری گر افکنی * لفظ به را از صراط المستقیم حق سبحانه و تعاليل إين بناء را در يناه خود داراد * قايله و كاتبه محمد محسن الهذنب ابن امير هاشم ١١

- 1. Khán Khánán Mun'im, the centre of the world, built this bridge by the grace of the Bountiful.
- 2. His name is Mun'im ['one who confers benefits'], because he bestows favors upon mankind and shews morey.
- 3. He has thus opened for himself a passage over the Cirát i mustagimt towards the beautiful gardens of Paradise.
- 4. You will arrive at the date if you throw the word bad out of 'Ciratulmustaqim.'

May God Almighty have this building in His keeping! The composer and writer of these verses is Muhammad Muhsin, a sinful man, son of Amír Háshim.

The value of the letters of the words 'Cirátul Mustaqím' is 981, and if • we subtract the value of the letters of 'bad,' i. e. 6, we get 981-6 = 975, A. H. The metre of the verses is short Ramal.

سپېر كرم خان خانان كه باشد درش قبلة جمله دلهاى آگاة پلے بست از سنگ برروی دریا کرو بگذرند اهل دل کاد و بیگاه چو از فضل الله شد بسته این پل ازان گشت تاریخ آن فضل الله

- His biography will be found in my Kin translation, pp. 317, 384. The tarikh given there is corrected below. Vide also Stewart's History of Bengal, p. 108.
- † The faithful before entering Paradise have to pass over a bridge called Cirát ul mustaqim, 'the established path,' which leads over a bottomless pit, but is as narrow and as sharp as the edge of a sword.

- The Khán Khánán of heavenly bounty, whose door is the cynosure of all wise hearts,
- 2. Built a stone bridge over the surface of the river, over which good people pass at all times.
- 3. As this bridge was built by the grace of God, its táríkh is the words 'Fazli allah' [the grace of God].

This gives 976 A. H. The metre is Mutaqárib i sálim.

ITT.

این عبارت عالی و اساس متعالی در ایام دولت حضرت السلطان الاعظم و المخاقان المعظم مظهر آثار السلطان ظل الله ابو الغازی جلال الدین صحمد اکبر پادشاه از خالص مال صاحب همت خیری اتمام یافت که نام و سال بنای و اتمامش هست این کل به بانی این منعم خان ه

This lofty edifice and noble foundation was successfully completed in the reign of his Majesty, the great Sultán, the exalted Kháqán, in whom the marks of royalty appear, the shadow of God, Abul Ghází Jaláluddín Muhammad Akbar Pádisháh, at the private cost of the generous Lord. The following táríkh contains his name, and the year in which (the bridge) was built and completed—'The builder of this (is) Mun'im Khán.' [A. H. 975.]

ابن پل عالي باهتمام نتيجة نتايج العظام *** في (؟) الانام خواجة نظام الدين كه *** [پسر] حضرت صخدومي اعظم اند قدس سرة العزيز و بهنرمندي نادر العصر استاد افضل على كابلي باتمام رسيد ال

This lofty bridge was completed under the superintendence of the effect of great effects [one word illegible] among men, Khwájah Shaikh Nizámuddín, who is the son of Hazrat Makhdúm i A'zam—may God sanctify his dear secret!—and by the skill of the master of the age, Ustád Afzal 'Alí of Kábul.

V.

The last inscription is a Rubá'í, of which, however, the first line is illegible. The last is—

اربیخ بذای آن چو جستم از غیب گفتند پل محمد منعم خان ۹۷۵

When I looked for a tárkh from the unseen world, (angels) said—'The bridge of Muhammad Mun'im Khán,' A. H. 975.

Maulawi Khairuddín of Alláhábád has given in his Jaunpúrnámah the first two inscriptions, together with a description of the bridge itself.

In the third escription, Akbar is called Abul Ghází, instead of Abul Fath.

2. Pa ni'pat.

Mr. J. G. Delmerick has sent to the Society a tracing of the following inscription from Pánípat.

* بانع این عمارت فیروز صحمد لطف الله افغان بانع این خیر در عهد سلطان السلاطین سکندر شاه بهلول شاه سلطان بکرم باری تعالی ترفیق یافت تا گدبذ حظیرهٔ بندگی شیخ المشایخ و الاولیاء شیخ جلال الحق و الشرع والدین قدس الله صرف العزیز برآورد بقاریخ دوم صاه شوال سنه اربع و تسعمایة ا

The builder of this edifice is Fírúz Muhammad Lutfullah, the Afghán. The builder of this religious edifice, during the reign of the King of Kings, Sikandar Sháh, son of Buhlúl Sháh, the king, was by the kindness of God vouchsafed the grace to erect the vault of the tomb of the revered Shaikh of Shaikhs and saints, Shaikh Jaláluddín (the glory of truth, the law and the faith)—may God sanctify his dear secret! Dated, 2nd Shawwál, 904. [13th May, 1499, A. D.]

Nothing is known of the builder. The saint, however, is a well-known personage, and all biographical works on Muhammadan Saints contain biographical notes of him. His full name is Shaikh Jaláluddín, (son of) Mahmúd of Kázarún, a town in Persia; but his real name was Muhammad, son of Mahmúd, Shaikh Shamsuddín Turk of Pánípat having conferred on him the title of Jaláluddín, 'the glory of the Faith.' He is the author of the Zád ulakbar, and he was twice in Makkah. It is said that he daily fed one thousand people, and even during his hunting excursions, of which he was passionately fond, his table always contained miraculously food for one thousand people. Many miracles are related of him. He was in high favour with Fírúz Sháh. Shaikh Jalál died on the 13th Rabí' I, 765 (20th December, 1363) and lies buried, together with his five sons, in Pánípat.

II.

Mr. Delmerick also sent a tracing of a Hindústání inscription from Pánípat. It seems that the tomb of Ibráhím Lodí was repaired in 1867 by the local authorities of that town; but unfortunately they have given the emperor Bábar a wrong name, calling him Ghiyásuddín Bábar, instead of Zahíruddín Bábar.

ا یه قبر بادشاه ابراهیم لودي کي هی که به قاتله بادشاه غیاث الدین بابر کے پاني پت مین کالن جنگ مین ساتهه اپنی فوج کے قتل هوا سنه ۱۸۹۰ هجري مین اور یه قبر سنه ۱۸۹۷ هجري مین موست و درست هوا

Muzaffarnagar.

From A. Cadell, Esq., C. S., the following readings of inscriptions from Majherah and Mornah, connected with the Sayyids of Bárha* (Muzaffarnagar District).

* Vide Ki'n translation, pp. 389 to 395; Journal, A. S. Bengal, for 1871, Pt. I, p. 260; Proceedings, A. S. Bengal, November, 1872, p. 166.

I. پادشاها جوم مارا در گذار ما گنهکاریم تو ۲مرز کار تو نکوکاري و ما بد کرده ایم جوم بي اندازه بیحد کرده ایم تاریخ رفات معادتمآب مرحومي مغفوري میران مید حسین پنجم شهر جماد الثَّالي سنة الف هجري *

- 1. O Lord, forgive our sins; for we are sinners and thou art forgiving.
- 2. Thou art good, but we are wicked and have committed endless crimes.

The date of the death of Mírán Sayyid Husain, the good, who has obtained pardon and forgiveness, is the 5th Jumáda, II, 1000. [9th March, 1592.]

در عهد محمد شاه یادشاه غازی این مسجد را معصومهٔ زمان بی بی جهبو بر مبلغ نه هزار روپیه در شهر صفر سنه یکهزار و یکصد و سی و هشتم هجری مطابق سنة هشتم جلوس والا تعمير كنانيد .

From the Mosque at Mornah.

In the reign of Muhammad Shah, Padishah i Ghazi, this mosque was ordered to be built by the chaste lady of the age, Bibi Jhabbu, at the cost of nine thousand rupocs, in the month of Cafar, 1138, [October, 1725], the eighth year of the auspicious accession.

Mr. Cadell writes—" This is one of the last of the substantial Sayyid buildings. Bíbí Jhabbú was the wife of Nawáb Hasan Khán, an Imperial Bakhshí, during the reign of Muhammad Sháh. Mornah is a Chatraurí settlement, and the Mornah Sayyids with other Chatrauris came to the front when the Tihanpúris lost ground."

The following papers were read-

On a new species of Kite, and notes on the genus Milvus generally.—By ANDREW ANDERSON, Esq., F. Z. S., with a note by W. E. Brooks, Esq., C. E.

(Received 5th June, 1873)

It is now nearly three years since I first recognized an undescribed species of migratory kite which appears to have escaped the notice of Indian Ornithologists, and the matter has been allowed to remain sub judice until I could be quite certain that the bird now brought before the public was really new to science. I have, however, alluded to it from time to time in a series of papers that have been published by the Zoological Society of London, ("Notes on the Raptorial birds of North Western India"), from which

the following extracts are taken, as giving some particulars relative to the habits of the bird in question.

"I have, however, specimens of a kite with all the characters of *Milvus major*, but considerably smaller. It is also a cold weather visitant, and is equally shy as the former. Mr. Brooks has examined these kites in my collection and agrees with me in referring them to another species: they may be *Milvus affinis*, or perhaps more probably *M. melanotis* of Temminck."

"Undoubtedly we have three species of kites in India, two of them being migratory." P. Z. S. 1872, p. 79.

"The small Marsh kites I have before referred to (p. 79) first made their appearance in ones and twos before the end of September; and they were then terribly wild; just as much so as *Milvus major*. Later in the season (December and January,) they became gregarious, and confined themselves to marshes and grassy swamps. As the season advanced, so their wariness seemed to wear off; and as the country dried up, they began associating with the village kites, till they became just as audacious as their allies *M. Govinda*.

"I have seen as many as fifty of the small Marsh kite on the wing at a time; and the conspicuous white or pale-buff patches under the wings suffice to distinguish them from the village kites at a glance."

"Early in the season the Marsh kites appear to keep to the open country, and then do not intermingle with the other species; but I have come across numerous places where villages are situated on the banks of swamps; and then, of course, both kinds are always to be seen together. They have now (14th March,) nearly vanished, and by the end of the month I do not think one will be left." P. Z. S. 1872, p. 623.

MILVUS PALUSTRIS, sp. nov.

The kite for which I have proposed this name, is somewhat smaller than M. govinda, Sykes; but in point of coloration it is very nearly a facsimile of M. major, Hume; in fact a perfect miniature of that species. While the amount of white under the wings, extending in some examples to two-thirds of the length of the primaries (confined, however, to the inner webs), and the rich rufous tone of the plumage generally, tend to assimilate M. palustris to M. major, these characters tend equally to separate the former from either of the other two species, viz., M Govinda and M. affinis, Gould (P. Z. S. 1837); i. e., supposing the latter to be really worthy of specific distinction as an Indian bird.* There is also a considerable amount

* Mr. Blyth, in his "Commentary on Dr. Jerdon's Birds of India.'" (Ibis, 1866; p. 248), does not appear to think that the ordinary Indian Kite is separable into two species:—"In every assemblage of Indian Kites there is much disparity of size, some males being considerably smaller than the largest females; and the former would

of white and pale buff about the head and neck of the new bird, which is never present in its common congener *M. govinda*, from which it has not hitherto been discriminated.

The following are the dimensions of specimens that have been forwarded to illustrate this paper:

No.	1	₽	Etáwah district,	Length	22	in.;	wing	17	in.
No.	2	₽	Mainpúri district,	;,	21	";	,,	$16\frac{3}{4}$,,
No.	3	ţ	Etáwah district,	,,	201	,, ;	,,	16	,,
No.	4	ţ	Sháhjahánpúr district,	"	20	;	••	16	**

These measurements correspond with those of the Australian bird (M. affinis, Gould), which Mr. Gurney states he has received from parts of India, and which Mr. Hume* scparates from M. Govinda (veru), on account of "its duller tints, and smaller size." † The italies are mine. The new kite, therefore, cannot be the Australian bird (M. affinis), for, so far from approaching M. Govinda in coloration, it differs widely from that species: (1) by its rufous toned plumage, and (2) by the white under the wings; which are characteristic of our new bird.

Neither can it be *M. melanotis*, Temminck, as I at one time supposed it might have been; for Mr. Gurney informs me (in epist.) that specimens of this kite, which he has received from Japan, vary from 25 to $28\frac{1}{2}$ inches in length (according to sex), with wings from $18\frac{1}{4}$ to $21\frac{1}{4}$ inches long, which measurements are exactly similar to those of *M. major.*. For the sake of comparison I forward a δ specimen of this kite, to shew the vast difference in size between it and our new bird; and yet how close they are in point of colour.

At one time I was inclined to believe that the subject of the present paper was perhaps only the young of M. Govinda; but a comparison with a Futtehgurh-born bird, will shew that this is quite impossible. The difference between the two species is sufficiently striking to be quite apparent to an ordinary observer.

seem to be undistinguishable from the Australian affinis; but I am not disposed to accept the opinion that there are two separable races of Milvus in the Indian and Indo-Chinese subregions." &c., &c.

- * Cf. "Stray Feathers," 1873, p. 161.
- † The examination of a large series of the common kites clearly shews that it is quite impossible to say where affinis ends, and where Govinda begins. As to the "duller tints" of the former, I find that this peculiarity is far from constant; and as to its "smaller size," I would give it as my opinion, that merely nominal difference in this respect in a bird measuring twenty one inches long cannot be sufficient to constitute a distinct species.
- ‡ Mr. Hodgeon was aware of the existence of this large kite, as his drawings contain figures of it under the name of "Milvus Indicus," Hodgson,
 - & Also sent with this paper.

The small Marsh kite is an extremely abundant species in the N. W. Provinces, and its appearance in September or October is a sure harbinger of the cold weather. It is gregarious, associating at times in large flocks; and in this respect it differs from its larger ally (*M. major*) which, as a rule, is a solitary bird.

Early in the season they are both extremely shy, thus affording a marked contrast to the permanently resident species (M. Govinda).

The summer habitat of *M. palustris* is still a desideratum. I have satisfied myself beyond doubt that it does not breed within our limits, numerous dissections proving the bird to be a late breeder.

In concluding my remarks on this subject, I wish to place on record the probable existence of another species of kite, considerably blacker and larger than the ordinary run of full sized Govindas. I have one specimen of this kite, a 3 of the same dimensions as M. major, but differing in the shape of its nostril (a characteristic feature in Raptorial birds) from all the other Indian species of Kites.

At first I inclined to the belief that in this bird I had got hold of the European *M. migrans*, Bodd; the more so, as Mr. Gurney has recorded it from Affghanistan. But on comparing this large black kite with a Russian-killed *M. migrans*, the difference between the two birds is very marked. The former was a breeding bird, with testes enormously developed, or I might have been inclined to have considered it merely a melanoid variety of *M. major*.

Note by W. E. Brooks.

I quite agree with my friend, Mr. Anderson, in separating this kite.

The tendency to pale buff under the wings is a remarkable characteristic of *M. palustris*, to which *M. major* is not subject; and in this respect it is not always an "exact miniature" of its large congener.

I have long known this kite, and once imagined it to be *M. melanotis*, Temm. and Schl. but the latter is now, I think, almost proved to be identical with *M. major*, Hume. I quite believe in their identity; for a bird so strikingly resembling *M. major* as *M. melanotis* does according to all accounts, is sure to have a corresponding amount of white under the wing. The alleged want of white in the wing of the latter is the only difference observed. This amount of white under the wing of *M. major* is variable; sometimes it is clear white, at other times only a mottling of white on the basal half of the inner webs of the primaries.

With reference to the idea entertained by Messrs. Hume and Anderson that there are two species of dusky kites of the Govinda type in India; I cannot believe in anything of the sort. I have one of the larger dusky kites referred to by Mr. Anderson, and I have examined his bird too; I have also

collected kites numerously from Etáwah to Asansol, places distant apart about 700 miles, and I cannot find any specific difference in plumage. The wing varies from 16 to 18 inches in length; but this is no greater variation than *M. major* is subject to; and the range of wing in *Aquila bifasciata* is from 20 to 24 inches, according to specimens in my collection. The dusky kites can be obtained with any length of wing between 16 and 18 inches, but they are one and all precisely identical in other respects. The male, too, is often quite as large as the average female. This should be taken into account before making another species of Govind kite. I do not agree with Mr. Anderson regarding the difference of nostril. Many of my smallest Govind kites have the same nostril. It is just such an amount of slight individual variation, as regards nostril, as I have observed in other species.

I think, therefore, that we may safely conclude that we have only three true kites in India: M. melanotis, M. Govinda or affinis, and M. palustris.

I have never seen Indian-killed examples of M. migrans or M. Ægyp-tius.

With regard to the types of M. Govinda, Mr. Gurney in a letter to me, dated 5th July, 1872, says, "Many years ago I examined in the Museum of the East India Company the two type specimens from which the late Col. Sykes originally described his M. Govinda. One of them appears to me to be identical with the Australian M. affinis, the other to be a somewhat larger bird, and I think of the form intermediate between M. melanotis and M. affinis, if such there really be as a distinct race."

It would appear from the foregoing that there is some difference between the two type birds of *M. Govinda*; and a critical re-examination of them is much to be desired. For my own part, I am not at all satisfied that *Milvus Govinda* is not *Milvus melanotis*.

The original description of Sykes' species is to be found in P. Z. S., 1832, p. 81.

Only two dimensions are given; "Longitudo corporis 26 unc.; and, "caudæ 11." The former is, I think, fatal against M. Govinda being the bird we now recognize as that species, i. e., the common Calcutta kite. The following are total lengths of several kites, the sexes of which were carefully ascertained:

				inches
M.	major,	ţ	.,	25 }
,,	,,	우	•••	$25\frac{1}{2}$
**	"	\$		25 1
"	,,	\$		$25\frac{1}{4}$
"	#1	Ş		241
	20	-	************	241

M.	Govinda	₫	***********	21
"	,,	ţ	•	22
"	,,	₿		231
"	,,	ţ		221
,,	"	₹		22 to 23)
"	"	₽	••••••	22 to 25 according to Mr. Hume
M.	major.	₫	or 2	27:7 to 29 in 'Stray Feathers.'

From the above dimensions it is apparent that a bird, in the flesh measuring 26 inches, cannot be our common kite. The probability is greatly in favour of its being *M. melanotis*. 26 in. could only be obtained by measuring a stretched skin of our common kite, and this an accomplished naturalist like Col. Sykes would hardly have done.

I have heard that Col. Sykes' types are all carefully packed away in boxes, and it is to be hoped moths' eggs have not been packed up with them. How necessary it is that these valuable types should be in some museum where they might be properly cared for, and accessible. In the British Museum they would be well cared for, and thither they ought to be sent.

There are several of Col. Sykes' types which require re-examination, and especially that of Sylvia Rama. Dr. Jerdon was under the impression that the true S. Rama was the smaller and more rufous bird separated by Mr. Hume as "Jerdonia agricolensis," after examining a series of both birds which I had prepared. The dimensions of Col. Sykes' original description favour Dr. Jerdon's view; for they decidedly indicate the smaller bird. I may mention in passing that the larger bird which Mr. Blyth regarded as Sylvia Rama, has been identified by Dr. Tristram with Sylvia caligata, Licht.

I have digressed thus from the subject in hand to shew the necessity for Sykes' types being accessible; and I know from experience, that it is a dangerous thing to shut up specimens in the tightest of boxes, unless they have been previously thoroughly baked. The chances are that all these valuable types have been reduced to a confused mass of feathers, or rather of the remains of feathers.

2. Notes on the Pteropi of India and its Islands, with descriptions of some new or little known species.—By G. E. Dobson, B. A., M. B., Staff Surgeon H. M.'s British Forces.

(Abstract.)

According to Drs. Peters' and Gray's lists of the species of *Pteropus* no less than fifty species exist of which half inhabit a few small islands in the Malay Archipelago, and one species only *Pt. medius*, Temm. is known from the Continent of India and Burma.

The writer believes that many of the so-called species which go to make up the large number from Malayana have been founded on insufficient grounds, as several are distinguished solely by the colour of the fur, a most fallacious character in many orders of Mammals, and especially so in the *Chiroptera*. Distinctions based on the shape of the skull and size and form of the teeth are not satisfactory, for it should certainly be possible to determine the species to which a given vertebrate animal belongs without first finding it necessary to kill and make a skeleton of it.

A very valuable character for distinguishing the species of *Pteropi*, as well as other species of *Chiroptera*, is shown to exist in the shape and relative size of the ears, the importance of which has not been sufficiently recognised. This if taken in connection with accurate measurements will, in most cases, if not in all, be found quite sufficient.

Pt. nicobaricus, Fitz. et Zel., from the Andaman and Nicobar Islands, is redescribed as it is impossible to recognise the species from the original description in the Zoology of the Novara expedition.* This species is at once distinguished from Pt. medius by the form of its ears which are rounded, not acutely pointed at the tips.

A well-marked variety of *Cynopterus marginatus*, *C. andamanensis*, is described, and *Cynopterus Sherzeri*, Fitz. et Zel. from the Nicobars distinguished from other species of the genus, the original description of this species being quite useless as a means of diagnosis.

A new species of *Cynonycteris* from the Malay Archipelago, *C. minor*, is also described. This species is readily distinguished from *C. amplexicaudatus*, Geoff. by its small cars which are also proportionately much narrower.

Other species of Indian *Pteropi* are redescribed, and a new genus, *Eonycteris*, is established for the reception of *Macroglossus spelæus*, Dobson.

8. Description of a new species of Vespertilio from the North-Western Himalaya.—By G. E. Dobson, B. A., M. B. (Abstract.)

The new species for which the name *Vespertilio murinoides* is proposed, resembles *V. murinus*, L. but is distinguished by its smaller size, by the shape of the ears and tragus which is very acutely pointed, not subacute, as in the latter species, and by the small-size of the first upper premolar.

Both papers will appear in the Journal.

4. Note on certain species of Phasmide hitherto referred to the genus Bacillus.—By JAMES WOOD-MASON, of Queen's College, Oxford.

The discovery which I have to announce, viz., that the true males of Bacillus insignis and its allies are to be sought in insects of the type of Reise der Oester. Freg. 'Novara,' Säugethiere, p. 11.

Lonchodes Stilpnus, Westw., Lonchodes pseudoporus, Westw. Lonchodes Russellii, Bates, &c., affords another instructive illustration not only of the extreme imperfection of our knowledge of this family of Orthopterous Insects, but also of the utter futility of any attempt satisfactorily to distribute the species composing it into genera, until we shall be in possession of the true pairs of many more of the described species.

In 1869 M. Henri de Saussure* proposed, prematurely as it turns out, to divide the genus Bacillus into three subgenera, one (Bacillus) for the reception of B. Rossii and its allies, another (Ramulus) for B. humilis. Westw., B. carinalatus, Sauss., &c., and a third (Baculum) for B. cunicularis, Westw., B. ramosus, Sauss, &c.; and in the first part of my memoir on the Phasmidæ,† I provisionally referred to the last named subgenus one known and three new species, pointing out that these agreed together in having the last dorsal abdominal segment longitudinally grooved, and mentioning, in the description of each species, the presence, in the posterior border of this segment, of an emargination filled by a well-developed supraanal plate which is invariably to be found in the females of all species of Lonchodes. I have long felt convinced that the insect of which a description is appended, was the male of my Bacillus (Baculum) insignis but have thought it better to wait for evidence confirmatory of the fact. has, at length, reached me from Ceylon, thanks to Mr. Hugh Nevill, C. C. C., who has been kind enough to send me, amongst other species of great interest and value, the two sexes of an insect agreeing admirably with M. de Saussure's description of L. pseudoporus, Westw.

The discovery of the male of *B. insignis* will obviously also necessitate the transference of the following species to the genus *Lonchodes:—Bacillus cunicularis* et *Hyphereon*, Westw. *B. patellifer* et scytale, Bates, *B. ramosus*, Sauss., *B. Penthesilea* et furcillatus, Wood-Mas.; and I strongly suspect that *B. Westwoodi* et scabriusculus will eventually have to follow them to the same genus.

LONCHODES INSIGNIS.

- Q Bacillus (Baculum) insignis, Wood-Mason, Journ. A. S. B., Vol. XLII, 1873, pp. 51, 52, pl. V. fig. 1, 2.
- 8 Body of excessive tenuity. Antennæ perfectly filiform, 24-jointed, reaching nearly, to the apex of the afterior femora. The head is almost a complete miniature of that of the female and in the specimen from which the dimensions given below are taken has, two minute tubercles between the eyes representing the well-developed horns of the opposite sex. Three dark dorsal

^{*} Mél. Orth. Fasc. II, pp. 111, 112.

[†] Journ. A. S. B., 1878Pt. II, No. I.

[‡] Op. cit., pp. 120, 121.

streaks, one median and two lateral, pass along the whole length of the body from the head to the end of the 6th abdominal segment. Both meso- and metathorax are dilated at either end but especially at the insertion of the legs, and have each a raised median dorsal carina. The six basal abdominal segments are slightly expanded at each end, as in spirit specimens of the female; the 7th and 8th are shorter than the preceding, sub-equal, and gradually widen, the former from the base to the apex, the latter from the apex to the base; the last is scarcely longer than these, and eleft for rather more than a third of its length, but the sides of the eleft are so closely approximated that no hiatus is visible as in many other species; seen from the side, this segment terminates in an obtuse, scarcely deflexed tip. The legs are devoid of all traces of the foliaceous lobes so conspicuous in the female, but present the same general structure; the intermediate femora are just perceptibly curved, and the four posterior tibiæ have a few inconspicuous spinules towards the apical end.

. Total length, 4 in. $7\frac{1}{2}$ lin., ant. $15\frac{1}{2}$, head 2, proth. $1\frac{3}{4}$, mesoth. 12, metath 11, abd. 24 + 6 = 30 lin., ant. legs $19 + 22 + 6\frac{1}{2} = 4$ in., inter. legs 12 + 12 + 5 = 2 in. 5 lin., post. legs $15 + 16 + 4\frac{1}{2} = 3$ in.

Hab. Samagooting, Naga Hills, with the female. Collected by Captain Butler.

The author exhibited the specimens referred to in the preceding note, and also invited the attention of the meeting to the following fine series of Australian insects belonging to the same family:

Lonchodes, n. sp., & Q. Hab. N. Queensland.

Lopaphus coccophagus, G. R. Gray, J. Hab. Samoa.

Cyphocrania Goliath, Gray, 2.

Cyphocrania Enceladus, Gray, ♂♀.

Acrophylla violascens, Leach, & Q.

Podacanthus Typhon, Gray, & Hab. Champion Bay, N. W. Australia.

Podacanthus viridiroseus, Curtis, 9.

Tropidoderus Childreni, Gray, ♂ ♀ et. ♀ var.

Extatosoma tiaratum, MacLeay, ♂ ♀ et larva.

The reading of the following papers was postponed.

- 1. Authorities for the History of the Portuguese in India. By T. W. H. Tolbort, Esq., C. S.
- 2. Note on two copper-plate grants of Govinda Chandra of Kanouj-By Bábu Rájendralála Mitra.

LIBRARY.

The following additions have been made to the Library, since the meeting held in June, last.

Presentations.

** Names of Donors in Capitals.

Monatsbericht, January, 1873.

Schott—Einige Zusätze und Verbesserungen zu seiner Abhandlung über die ächten Kirgisen. Borchardt—Untersuchungen über die Elasticität fester isotroper Körper unter Berücksichtigung der Wärme. Dove—Die meteorologischen Unterschiede der Nordhälfte und Südhälfte der Erde.

THE ROYAL PRUSSIAN ACADEMY OF SCIENCES OF BERLIN. Bulletin, April, 1873.

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L. Rice—Nágamangala Copper-plate Inscription. W. Ramsay—Sapta Sringa. Capt. S. B. Miles—Archeological remains in Mekran. Dr. Bühler—On a Prakita Glossary entitled Paiyalachhi. Rev. F. Kittel—Coorg Superstitions. W. F. Sinclair—Notes on Natural History. Dinshah Ardeshir Taleyarkhan—Legend of Vellur. Three Copper-plate grants from the Krishna district. Archeology of Belári district.

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Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent thereon.

	ight of ometer aht.	Range du	of the Baring the d	rometer ay.	Mean Dry Bulb Thermometer.		of the Te luring the	
Date.	Mean Height of the Barometer at 32° Faht.	Max.	Min.	Diff.	Mean D Thermo	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	0	0	0	0
1	29.407	29.455	29.325	0.130	87.6	99.0	82.5	16.5
2	.412	.471	.327	.144	91.4	103.0	84.0	19.0
3	.506	.592	.456	.136	88.8	95.2	86.0	9.2
4	.577	.661	.522	.139	88.4	91.2	83.0	11.2
5	.619	.672	.558	.114	89.3	96.4	81.5	11.9
6	.617	.682	.529	.153	89.1	96 5	82.0	14.5
7	.583	.649	.509	.140	88.1	95.0	82.6	12.4
8	.556	.602	.500	.102	88.1	95.6	82.0	13.6
9	.561	.603	.499	.104	88.5	96.2	82.0	14.2
10	.554	.602	.467	.135	89.1	97.0	82.0	15.0
11	.478	.537	.399	.138	88.4	95.4	83.0	12.4
12	.415	.477	.326	.151	89.0	98.7	83.5	15.2
13	.424	.494	.370	.124	85.9	98.7	78.0	20.7
14	.462	.511	.391	.120	83.6	92.9	78.5	14.4
15	.451	.495	.393	.102	85.4	91.5	81.2	10.3
16	.487	.533	.432	.101	80.8	83.5	78.5	5.0
17	.505	.548	.451	.097	83.2	90.7	79.0	11.7
18	.476	.521	.411	.110	85.1	92.7	78.8	13.9
19	.490	.531	.442	.089	86.3	93.0	80.0	13.0
20	.491	,531	.435	.096	88.8	96.2	83.3	12.9
21	.491	.526	.437	.089	89.2	96.8	83.5	13.3
22	486	.542	.426	.116	88.8	98.5	79.5	19.0
23	.533	.601	.491	.110	86.9	95.5	79.8	15.7
24	.542	.601	.488	.113	89.1	95.0	84.0	11.0
25	.517	.566	.452	.114	90.2	98.5	84.2	14.3
26	.472	.518	.409	.109	92.1	102.3	84.5	17.8
27	.492	.547	.422	.125	92.4	102.8	85.3	17.5
28	.537	.583	.457	.126	89.3	99.8	81.0	18.8
29	.543	.591	.470	.121	88.0	97.2	82.6	14.6
30	.563	,600	•502	.098	85.7	93.7	82.5	11.2

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

			-					
Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	MeanWeight of Vapou in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity. complete saturation being unity.
	o	0	0	0	Inches.	T. gr.	T. gr.	Ì
1	81.3 83.3	6.3	77.5	10.1	0.925	9.84	3 68	0.73
2	83.3	8.1	78.4	13.0	.952	10.04	5.06	.67
3	84.1	4.7	81.3	7.5	1.043	11.06	2.94	.79
4	84.1 83.4	5.0	80.4	8.0	.014	10.76	2.94 3.08	.78
5	83.5	5.0 5.8 6.7	80.0	7.5 8.0 9.3 10.7	.001	.62	.59 4.01 3.82	.75
6	82.1	6.7	78.4 77.7	10.7	0.952	.08	4.01	.71
7	81.6	6.5	77.7	1 11)/4	.931	9.90	3.82	.72
1 2 3 4 5 6 7 8 9	81.1 81.5	7.0	76.9 77.3	11.2 11.2 11.5 10.2	.908 .919 .928 .946 .958 .882 .910	.61	4.08 .12	.67 .79 .78 .75 .71 .70 .70 .70 .73 .72 .73 .83 .83 .85 .81 .79 .75
9	81.5	7.0	77.3	11.2	.919	.76	.12	.70
10	81.9	7.2 6.4	77.6	11.5	.928	.83	.29 3.79	.70
11 12	82.0	6.4	78.2	10.2	.916	10.05	3.79	.73
12	82.5	6.5	78.6	10.4 9.9	.958	.17 9.41	.91	.72
13	80.1 79.7	5.8 3.9	76.0	9.9	.882	9.41	.46 2.28	.73
13 14 15 16 17 18 19	79.7	3.9	77.0	6.6 5.8 2.2 5.1 6.5	.910	.75	2.28	.81
15	82.0	3.4 1.3 3.0 3.8	79.6	5.8	.989 .958	10.56	.12 0.73 1.77 2.34 .67 3.01 .52	.83
16	79.5	1.3	78.6	2.2	.958	.34	0.73	.93
17	80.2	3.0	78.1	5.L	.943 .958	.12 .23	1.77	.85
18	81.3	3.8	78.6	0.0	.856	.25 .35	2.34	.81
19	82.0	4.3	79.0	7.3 7.7	.970	.00	.67	.80
20	84.0	4.8	81.1 80.1	7.7	1.037 .005	.99	8.01	.79
21 22	83.5	5.7 6.1	79.0	9.L	0.070	.64 .29	.52	.75
22	82.7	0.1	75.7	9.1 9.8 11.2	0.970 .873	9.30	.71	74
23	79.9	7.0	79.7	0.4	.992	10.53	.95 .59	.70
24	83.2	5.9 7.3	78.5	117	.955	.10	.59	.75
25	82.9	7.3	77.9	14.9	.937	9.88	4.49	.69
23 24 25 26 27	83.2	8.9 7.8 6.4	70.0	9.4 11.7 14.2 12.5 10.0	908	10.50	5.53	.04
27	84.6	7.8	79.9 79.1	10.0	.998 .973	.32	.04 3.89	.00
28	82.9	4.6	80.6	7.4	1.021	.86	2.89 2.82	70
29 30	83.4 82.3	3.4	79.9	5.8	0.998	.65	.15	.69 .64 .68 .73 .79 .83
<i>9</i> 0	04.0	V-7	,,,,				.10	,Qu

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1878.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	eight of meter at	Range of for each the		the Barometer hour during month.		ture	Range of the Tempera- ture for each hour during the month.			
Hour.	Mean Height or the Barometer a 32° Faht.	Max.	Min.	Diff.	Mean Dry Bul Thermometer.	Max.	Min.	Diff.		
	Inches.	Inches.	Inches.	Inches.	0	0	o	o		
Mid- night.	29.526	29.649	29.413	0.236	84.1	88.5	79.0	9.5		
1	.514	.631	.389	.242	83.9	87.8	79.2	8.6		
2	.502	.616	.382	.234	83.7	87.0	79.2	7.8		
3	.491	.609	.383	.226	83.5	86.7	79.0	7.7		
3 4	.490	.612	.394	.218	83.3	86.5	79.0	7.5		
5	.502	.630	.405	.225	83.2	86.2	79.0	7.2		
6	.514	.634	.410	.224	83.3	86.4	78.8	7.6		
7	.531	.660	.431	.226	84.3	87.0	79.9	7.1		
8	.545	.672	.433	.239	86.1	89.2	79.5	9.7		
9	.549	.670	.452	.218	88.2	92.0	78.6	13.4		
10	.547	.665	.440	.225 .219	90.4 92.0	95.2 96.7	78.5 78.5	16.7 18.2		
ii	.541	.653	.434	.219	92.0	86.7	78.0	16.2		
Noon.	.527	.637	.405	.232	93.6	98.5	78.8	19.7		
1	.507	.617	.372	.245	94.6	100.4	79.4	21.0		
2	.486	.595	.356	.239	94.8	102.0	80.3	21.7		
3	.464	.578	.338	.240	95.0	103.0	81.0	22.0		
4	.451	.559	.325	.234	94.3	102.6	81.3	21.3		
5	.452	.558	.338	.220	92.4	101.5	81.0	20.5		
5 6	.463	.570	.347	.223 .	89.6	98.8	78.0	20.8		
7	.482	.604	.362	.242	87.6	94.0	78.0	16.0		
8	.506	.630	.391	.239	86.5	91.7	78.5 79.0	13.2 11.4		
9	.525	.682	.410	.272	85.6 84.7	90.4 89.0	79.0	10.0		
10	.541	.666	.428 .428	.238 .228	84.4	88.7	79.0	9.7		
11	.541	.656	.420	.440	03.3	00.7	, 0.0			

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

Hour.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	'Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity. complete saturation being unity.
	0	o	0	o	Inches.	T. gr.	T. gr.	
Midnight. 1 2 3 4 5 6 7 8 9 10 11	81.3 81.4 81.3 81.2 81.2 81.9 82.5 82.9 83.3	2 8 2.5 2.3 2.2 2.1 1.9 2.4 3.6 5.3 7.5 8.7	79.3 79.6 79.8 79.7 79.8 80.1 80.2 80.0 79.7 78.4 78.1	4.8 4.3 3.9 3.7 3.6 3.4 3.2 4.1 6.1 8.5 12.0 13.9	0.979 .989 .995 .995 .995 1.005 .008 .001 0.992 .952	10.48 .60 .66 .66 .63 .69 .77 .79 .68 .53 .06 9.93	1.73 .53 .41 .34 .30 .20 .16 .49 2.27 3.23 4.61 5.43	0.86 .87 .88 .89 .90 .90 .88 .83 .77 .69
Noon. 1 2 3 4 5 6 7 8 9 10	83.4 83.6 83.6 83.7 83.5 82.9 82.2 81.6 81.5 81.5 81.3	10.2 11.0 11.2 11.3 10.8 9.5 7.4 6.0 4.1 3.7 3.1	77.3 77.0 76.9 76.9 77.0 77.2 77.8 78.0 78.7 78.6 78.4 79.1	16.3 17.6 17.9 18.1 17.3 15.2 11.8 9.6 7.8 7.0 6.3 5.3	.919 .910 .908 .908 .910 .916 .934 .940 .961 .958 .952 .973	.66 .53 .51 .55 .65 .89 10.24 .23 .19	6:42 7.02 .14 .23 6.86 5.89 4.44 3.53 2.86 .53 .23 1.89	.60 .58 .57 .57 .58 .62 .69 .74 .78 .80 .82

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1873.

Solar Radiation, Weather, &c.

	olar n.	Guage above ound.	Wind.			
	Max. Solar radiation.	Rain Gu 1½ ft. ab Groun	Prevailing direction.	Max. Pressure	Daily Velocity	General aspect of the Sky.
1	o 145.0	Inches 0.36	SE	1b 4.0	Miles 137.4	S to 6 A. M., \i to 10 A. M., \i to 5 P. M. S to 11 P. M. T between 13 & 2\frac{1}{2} & at 5 P. M. L at 2 & 4
2	144.0		S E, W S W & S		172.8	A. M. R from 13 to 23 P. M. i to 3 A. M., S to 7 A. M. i
3	143.0	0.07	S S W & S	1.0	279.1	to 7 P. M. S to 11 P. M. S to 10 A. M., oi to 7 P. M. O to 11 P. M. T at 8 A. M. L on N
4.	137.0		wsw	2.0	322.0	W at 8 and 9 p. M. Slight R from 6½ to 9½ at 11¾ A. M. & 7½ p. M. O to 6 A. M., S to 10 A. M. ~i
_	10,10	•	***			to 2 P. M. \i to 9 P. M. O to 11 P. M. L at 11 P. M. D at 111
5	146.0		W by S & S		280.1	O to 7 A. M., hi to 2 P.M. oi
6	147.0		S by W & S	0.2	288.6	to 5 p. m. i to 11 p. m. i to 7a. m., i to 6 p. m. S t oll p. m. L between 7 & 8 and
						at10 P. M. D between 8 and 9 P. M.
7	145.0		SSW&S	0.5	282.0	A. M. O to 8 A. M. ~i to 6 P. M.
8	141.0		S&SSW	0.6	257.0	B to 9 p. m. \i to 11 p. m. \i to 5 A. m., \i to 10 A. m.,
9	145.0		S & S by E	0.3	239.1	i to 6 p. m., i to 11 p. m., i to 8 a. m., i to 7 p. m. B
10	147.0	•	S by E & S S E	0.4	234.9	B to 4 A. M., \ito 7 A. M., \i to 5 P. M., \ito 11 P. M.
11	140.2		SSE&SE		179.6	i to 2 a. m. S to 9 a. m., i to 3 p. m. i to 11 p. m. L on N
12	144.0		SE&E by N		120.8	E between 7 & 8 p. m. \i to 3 a. m. S to 8 a. m., \cap i to 5 p. m. S to 11 p. m. T at 41
						P. M. L on S W from 8 to 10 P. M. D at 5\frac{1}{2} A. M. 3\frac{1}{2} & 4\frac{1}{2} P.M.
-						

`i Cirri,—i Strati, ^i Cumuli, ∟i Cirro-strati, ^i Cumulo-strati, ∖i Nimib, `i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the month of June 1873.

Solar Radiation, Weather, &c.

	lar	age ove	Wind.		
4,50	Max. Solar	Rain Guage	Prevailing direction.	Daily Velocity.	General aspect of the Sky.
1:	3 136.	, and the	SE&W 9.0		S to 6 A. M., \i to 10 A. M. S to 3 P. M. O to 11 P. M. High
14	138.2	0.86	W S W&Variable 4.3	166·9	wind between 3\frac{2}{3} & 4\frac{1}{3} \text{P. M. T & L between 4 & 5 P. M. R at 4, 5 & 7 P. M. O to 9 A. M \cap i to 4 P. M. O to 11 P. M. High wind from 5\frac{1}{3} co 5\frac{2}{3} P. M. T between 2 & 3 A. M. & from 4 to 5\frac{1}{3} P. M. L between 2 & 3 A. M., & from 5\frac{1}{3} to 10 P. M.
15	121.0] SE & Variable	97.6	Rat 2½ A.M., & from 5½ to 8 P.M. O to 11 A.M. S to 11 P.M. T
16		0.06	E & S	90.0	t 31 P. M. O to 6 P.M. S to 11 P.M. Tat
17	137.0	0.50	S & S W 2.8	81.2 to	3 A. M. L on W at 8 P. M. Light t after intervals. S to 11 A. M., ai to 6 P. M. O > 8 P. M. B to 11 P. M. Brisk ind between 6 3 & 7 P. M. Slight at 3 2, 7 A. M. & between 7 &
18	139.0	0.43	88W&8W	131.9 to P.	P. M. B to 3 a. M., \si to 7 a. M., \si 12 a. M., \si to 3 P. M. S to 11 M. L at 8 & 9 P. M. T & R
19	139.0		88 W & 8 W 1	55.9	tween 9 & 10 p. m. S to 8 a. m., hi to 4 p. m. S
20	141.5		SW&S 1	13.1 to	11 P. M. L at 8 P. M. S to 2 A. M. O to 7 A. M., \i 9 A. M., \i to 12 A. M., \i to P. M. O to 11 P. M. L on N E
21	140.0		88W&8W 1	77.9	8 р. м. О to 2 а. м. S to 8 а. м., \i
22	142.0	0.06	88W&8W 9.0 .1	17.8 to	4 P.M. S to 7 P.M. O to 11 P.M. \i to 12 A. M. S to 7 P. M. O 11 P. M. High wind from 8 to
1		.		8₹ L	\$\frac{1}{2}\$ to \$10 \text{ P. m. T at \$9\frac{1}{4}\$ P.m. From 7 to \$11 \text{ P. m. Light R at \$\frac{1}{4}\$ P.m.

[`]i Cirri,—i Strati, ^i Cumuli, ∟i Cirro-strati, ~i Cumulo-strati, 〜i Nimbi, 'mi Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning R. rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, gin the month of June 1873.

Solar Radiation, Weather, &c.,

		lage oove d.	Wini	D.					
	Ma rac	tam Guage tr. above Ground.	Prevailing direction.	Max. Pressu	Daily Velocity	General aspect of the Sky.			
	0 146.0	Inch 0.02	ssw	0.5	154.7	O to 6 A. M., \i & \i to 2 P. M. \i to 7 P. M. S to 11 P. M. L at midnight & from 8 to 10 P. M. Light R at midnight & 9?			
21	145.0		ssw &s w	3.2	79.2	to 1 P. M. S to 11 P. M. Brisk wind at 93 P. M. Lat 8 & 9 P.M.			
	138.5		N E & Variable.		73.8	D at $4\frac{1}{2}$ A. M. O to 8 A. M. S to 12 A. M., \sqrt{i}			
	145.0		N W & S by W		106.9	to 11 p. m. B to 2 a. m., \io to 8 a. m. B to 11 a. m., \io to 6 p. m. B to 11 p. m. L on N at 10 p. m.			
27	145.6		S by W. & S		108.2	Chiefly B.			
28,	143.9	0.30	S&SSW	4.3	169.6				
29	142.0		SSW&S SE	0.9					
3 0	136.8		S&SE	0.4	121.6	S to 5 A. M., \i to 7 A. M., \i to 12 A. M. O to 4 P M. S to 8 . M. O to 11 P. M. T from 12; A. M., to 2; P. M. L at 2; P. M. D at 12; A. M. 1 & 3 P. M.			

^{\`}i Cirri —i Strati, ^i Cumuli, _i Cirro-strati, ^i Cumulo-strati _i Nimbi, \'i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of June 1873.

MONTHLY RESULTS.

		
	:	Inches.
Mean height of the Barometer for the month		29.508
Max. height of the Barometer occurred at 9 P. M. on the 6th		29.682
Min. height of the Barometer occurred at 4 P. M. on the 1st		29.325
		0.357
Extreme range of the Barometer during the month		
Mean of the daily Max. Pressures		29.561
Ditto ditto Min. ditto		29.443
Mean daily range of the Barometer during the month	•••	0.118
75 70 70 11 671		0- 0
Mean Dry Bulb Thermometer for the month		87.9
Max. Temperature occurred at 3 r. m. on the 2nd		103.0
Min. Temperature occurred at 6 & 7 P. M, on the 13th		78.0
Extreme range of the Temperature during the month		25.0
Mean of the daily Max. Temperature		96.1
Ditto ditto Min. ditto		82.0
Mean daily range of the Temperature during the month		14.1
Mean Wet Bulb Thermometer for the month		82.2
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer	••	5.7
	• • •	78.8
	• • •	9.1
and the same and t		
	I	nches.
Mean Elastic force of Vapour for the month		0.964
• •		
• Tr	o y (grain.
Mean Weight of Vapour for the month		10.25
4 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		3.39
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	••	1.64
Total amount of rain during the month	••	4.30
Total amount of rain indicated by the Gauge* attached to the anemo	-	
meter during the month	••	3.44
Prevailing direction of the Wind S. S.	W	& S.

^{*} Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of June 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

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PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR AUGUST, 1879.

The Monthly General Meeting of the Society was held on Wednesday, the 6th instant, at 9 o'clock P.'M.

Col. H. Hyde, R. E., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following presentations were laid on the table—

1. From the Government of India-

A copy of "Report of a Tour made by Captain Miles to Kedj and Punjgoor and his return viâ Kurrachi."

A copy each of Æsop's Fables and the Gospel of St. Luke, translated into the Swaheli language by Dr. Steere, Zanzibar.

A copy of a "Diary of a Journey from Bunder Abbas to Baghdad, viâ Seistan, Meshed and Teheran" by Mr. G. Rozario, late in medical charge of the Seistan Mission.

- 2. From the Imperial Government of Brazil—A copy of a work entitled "Climat, Géologie, Faune, et Géographie Botanique du Brésil," by Mr. E. Liais.
- 3. From the Directors of the Batavian Society of Arts and Sciences two copies of "Photographien naar Oudheden van Java, door J. van Kinsbergen."

The following letter accompanied the donation-

'We have the pleasure to inform you that through the Netherlands India Steam Navigation Company we have forwarded to the address of your Society, as per enclosed bill of lading, a case containing a collection of photographs representing part of the antiquities of Java.

'In the 33rd volume of the Transactions of our Society will be found an elaborate monograph on Hinduism in Java, a posthumous work of the Rev. J. F. G. Brumund, Protestant Minister at Batavia, who, at the suggestion of

our Society, was entrusted by the Government of Netherlandish India with the task of visiting and describing the remains of the Hindu period, but who unfortunately was prevented by his untimely decease from accomplishing his studies, leaving unfinished a work which, when completed, would unquestionably have become one of the most interesting sources of our knowledge of the pre-Mahomedan period of Java.

Together with the proposal of our Direction to entrust to the Rev. J. F. G. Brumund the description of the various monuments, we called the attention of the India Government to the necessity of having the monuments, at least the most interesting of them, reproduced by an able photographer, and according to our advice, Government made choice of Mr. v. Kinsbergen, who under our control and according to our instructions has been occupied for some years in forming the collection of which a copy is now presented to your learned Society through our instructions, but in the name of the Government of Netherlandish India.

'The photographs are accompanied by a catalogue from which you will please to observe that only the smaller part of them has been described in the above quoted work of Mr. Brumund, a new copy of which will be found in the parcel, containing the latest publications of our Society, which we have at the same time forwarded to your address.

'Nearly all the antiquities that have been found in the Residencies of Bagelen, Gidiri, &c., were photographed after the death of Mr. Brumund, and till now our endeavours to find a person capable of continuing the labours of our lamented colleague, have been unsuccessful. On the other hand however, Mr. v. Kinsbergen has again been commissioned by Government to complete the present collection of photographs by reproducing in detail that most splendid monument in the residency of Kadæ known to all students of Hindu art and history under the widespread name of the Boro Boedoer.

'Some more remnants of the earlier period of history in that part of Java will be added to the collection, and through the liberality of our Government, the learned world in Europe will in a couple of years have at their disposal a nearly complete representation of the most remarkable remains of the Hindu period, which have escaped the mutilating hand of man, and the destructive influence of time and climate.'

The President drew the attention of the meeting to the unusually valuable and interesting nature of this fine collection of photographs and proposed a vote of thanks to the Batavian Society of Arts and Sciences.

Mr. Blochmann seconded the proposal, and it was carried unanimously.

4. From the French Minister of Marine, Paris.—A copy of "Voyage d'Exploration en Indo-Chine," by M. M. de Lagrée and Garnier.

A vote of thanks to the French Department of Marine for this splendid work, proposed by the President, seconded by Mr. Blochmann, was carried unanimously.

Mr. Blochmann exhibited the following two coins forwarded to him for exhibition by the Rev. Mr. Trleton, Rúpar.

1. A Qutbuddín Mubáraksháhí, silver and copper. New variety.

Square. Weight, 83.386 grains. A. H. 719.

الأصام الاعظم قطب الدنيا و الدين ابو المظفو ١٩ - OBVERSE.

مداركشاع خليفة الله Reverse.-In a small circle

and along the four sides.— منظان الوائق بالله إمير المومنين Similar coins were published by Mr. Thomas, 'Chronicles,' pp. 179 to

A coin struck by Mu'izzuddín Mubárak Sháh. Silver. New variety. Round. Weight, 74.812 grains. A. H. 833.

REVERSE.—Within a square, the Kalimah. The square is inscribed in a lozenge, and the four spaces between the sides of the square and sides of the lozenge contain the names of the four Khalifahs. In the first line of the obverse, the coin has a punch mark. Vide Thomas, 'Chronicles,' p. 333.

A letter was read from the Rev. Mr. Erhardt, Superintendent of the Secundra Orphanage, in reply to a letter of the Secretary, written in compliance with the resolution passed at the general meeting in June, asking for further information as to the fact of the finding of certain children in the company of wolves. Mr. Erhardt gave no new facts, but stated his very strong belief of one of the children referred to having been burnt out of a wolves' den, such belief being founded on the extremely animal-like and filthy propensities of the child when brought to the asylum, the recent burns on his person and the testimony of the persons who brought him.

The following gentlemen duly proposed and seconded, were balloted for and elected ordinary members.

J. C. Parker, Esq.
W. J. Olpherts, Esq.
Licut. C. T. Bingham.
Kumára Grischandra Sinha Bahádur.
Bábu Jogeshchandra Dutt.
Alexander Pedler, Esq.
Col. W. E. Marshall.
W. G. Bligh, Esq.
Capt. W. F. Badgley.
Licut. R. G. Woodthorpe, R. E.
D. D. Cunningham, Esq., M. B.
Capt. J. Butler, (re-elected).

Mr. E. Van Cutsem has intimated his desire to withdraw from the Society.

Mr. H. Blochmann exhibited rubbings of the following inscriptions received from General A. Cunningham, C. S. I., in continuation of the rubbings shewn at the last meeting.

Ra'pri'

The 'Alauddin Khilji Inscription of the 'I'dgah at Rapri.

بناء ابن بقعةً شريف بتوفيق يزداني و تائيد سبحاني و بفضل رباني در مهد خلافة سكندر الثاني علاء الدنيا و الدين المخصوص بعنايت رب العالمين الو المظفر محمد شاة السلطان ناصر امير المومنين و نوبت ايالت بندة كمترين خدايكاني كافور سلطاني تقبل الله منهم و احسن الله جزاءهم في المنتصف من شهر المبارك رمضان عظم الله حرمته سنة احدى عشر و سبعهاية ال

The building of this noble work [took place] by the grace of God and the assistance of the Almighty and the favour of the Lord, during the time of the reign of the second Alexander, 'Aláuddunyá waddín, who is distinguished by the kindness of the Lord of the worlds, Abul Muzaffar Muhammad Sháh, the king, thể helper of the Commander of the Faithful, and during the governorship of the mean slave of his Majesty, Káfár, the Royal—may God accept it from them, and may God give them an excellent reward! In the middle of the blessed mouth of Ramazán (may God increase its honor!) of the year 711. [End of February, 1312, A. D.]

The tablet measures 5 feet by 2 feet, and consists of four lines. The letters are thick and clumsy.

The inscription refers to the end of 711, when Malik Káfúr came back to Dihlí laden with the treasures of Malabar and Dhúr Samundar.

Ráprí is often mentioned in early Muhammadan history. It lies S. E. of Agrah, on the left bank of the Jamuná, opposite to Batesar. It is now in ruins, the chief town of the Parganah being Shikohábád (named after Dárá Shikoh).

Mahoba'.

Mahobá lies near the southern boundary of the N. W. Provinces, halfway between Kánhpúr and Ságar.

During the Muhammadan rule it belonged to Sirkár Kálinjar, and was famous for its excellent betel leaves, of which it had annually to furnish 120,000. During the reign of Fírúz Sháh (III) it was for a long time the jágír of Naçir Khán, and after him that of his son Sulaimán (A. H. 781, or A. D. 1379). *Badáoni*, I, 251.

The Ghiyásuddin Tughluq Inscription on the Mosque of Mahobá.

بفضل ایزدی آمد بشارت که صبحد در مهوبا شد عمارت

بعهد پادشاهی هفت اقلیم صدار العملکت ملجای اسلام

غیاث الدین و دنیا دومین جم فیاث الدین و دنیا دومین جم

جهاندارے که زخم گرز وخلجر شدش ضبط ممالک چون سکندر

. فلکسان در زمانه مهربان باد بگیتی تخت ملکش جاودان باد

کمینه بندهٔ شساهی نکونام که شد در نوبتش مسجد باتمام

ملک تاج الدول بابخت سرمت محمد خلق نیکو اسم احمد

ملک تاج الدول بابخت سرمت محمد خلق نیکو اسم احمد

بسلگ عون یزدان درکشیده

چو برهفصد فزون شد بست ودو راست در و دیوار صحن مسجد آراست زهجرت در ربیع آخرین بود

- 1. By the favour of God the good news arrived that the Mosque had been built at Mahobá,
- 2. During the reign of the king of the seven zones, the centre of royalty, the asylum of Islám,
- 3. Ghiyás ud dunyá waddín, a second Jam, whose throno is (as high as) the heaven, Tughluq, the king of the world,
- 4. A king who, like Alexander, by the force of his club and sword, conquered countries.
- 5. May he, like the heaven, be kind in his reign, and may the throne of his kingdom be everlasting in the world!
 - 6. A mean slave of the famous king, in whose reign the mosque was completed,
- Malik Tájuddaulah, the fortunate, mildas Muhammad, whose excellent name is Ahmad.
 - 8. Has with the help of God * * * * (illegible)
- 9. When twenty-two years had passed beyond 700, he built the door, the wall, and the courtyard of the mosque.
- 10. It was in Rabí 'II. of the Hijrat, that his kind hand was engaged in building this edifice.

Thus the mosque was built by Malik Tájuddín Ahmad, in Rabí' II, 722, A. H., or May, 1322, A. D.

An imperfect reading of this inscription, together with two modern inscriptions from the Hamírpúr District, were some time ago received by the Society from Mr. E. T. Atkinson, C. S. The first of the modern ones refers to the building of a Mosque and the digging of a well by one Khwájah Fírúz during the reign of Aurangzíb, but the reading is not metrical. The second inscription is (metre, khafíf)—

- 1. In the reign of 'A'lamgír, the king, this well, which is like the water of life, was dug.
- 2. The Fort was without water. Genius, therefore, said that the date was given in the words 'A'b dád Hátim Khán,' 'Hátim Khán procured water.'

This gives A. H. 1113, or A. D. 1701.

Dihli'.

1. The Firuz Shah Inscription of 753 A. H.

قال رسول الله صلى الله عليه وسلم إذا رايتم الرجل يتعاهد المسجد فاشهدوا اليه بالايمان فأن الله يقول إنها يعمر مساجد الله من آمن بالله و اليوم الآخر «بناء اين مسجد در عهد دولت سلطان اعظم قهرمان معظم الواثق بتأليد الرحمن ابو المظفر فيروز شالا السلطان خلد الله ملكه و مسطانه بانى اين خير بندا اميدوار درحمت پروردگار بهادر مولى مولى امير المومنين المدعو بنثار خان تقبل الله منه في الغزة من رمضان سنة ثلث و خمسين و سبعياية اا

The Prophet of God—may God's blessings rest on him !—says, "If you see that the man pledges himself to the mosque, testify in his favour; for God says, 'Surely he who believes in God and the last day, will build the mosques of God.' [Qorán.]

The building of this mosque [took place] in the time of the reign of the great Sultán, the exalted sovereign, who trusts in the help of the Almighty, Abul Muzasfar Fírúz Sháh, the king,—may God perpetuate his kingdom and rule! The builder of this religious edifice is the slave who hopes in God's mercy, Bahádur Maulá, the freed slave (maulá) of the Commander of the Faithful, who is called Nisár Khán—may God accept it of him! On the first day of Ramazán, 753. [11th October, 1352.]

The inscription measures about 4½ feet by 2 feet, and consists of four lines without the usual bars between the lines. The letters are clumsy, and there are no diacritical points. Hence my reading of the name of the builder 'Nisár Khán' is somewhat doubtful.

The inscription is of interest as it belongs to the very beginning of Fírúz Sháh's reign.

2. The Sikandar Shah Inscription of 900 A. H.

بسمام الله الرحمن الرحيم

قال الله تبارک و تعالی و ان المساجد لله فلا تدعوا مع الله اهدا عمارت این بقعهٔ شویف در عهد سلطان السلاطین بادشاه ربع مسکون برگزیدهٔ حضرت کن فیکون الواثق بالقائیده الرحمن ابو المظفر سکندر شاه بن بهلول شاه سلطان کاله خلد الله ملکه و سلطانه و اعلی امره و شانه در عمارت مسجد جامع بوع (۴) بناکردهٔ مغفور مرحوم ابو اصجد *** و تاریخ غرهٔ ماه ربع الاول سنه تسعمایه ا

God who is blessed and exalted has said, "Surely the mosques belong to God, do not call on any one else besides God" [Qorán]. The building of this excellent work of piety [took place] during the reign of the king of kings, the ruler of the inhabited quarter of the world, the chosen of the Lord who said 'Let there be,' and it was, who trusts in the assistance of the All-merciful, Abul Muzaffar Sikandar Sháh, son of Buhlúl Sháh, Sultán Kálah—may God perpetuate his kingdom and rule and elevate his condition and dignity! This door of the building of the Jámi' Masjid [one word without meaning] was erected by the pardoned, deceased Abú Amjad **** fillegible]. Dated 1st Rabi' I, 900. [30th November, 1494].

This inscription contains nine lines, separated by the usual bars, and looks more like a headstone than a mosque inscription.

3. Inscription from the tomb of one Daulat Khán (A. H. 920.). در عهد همايون سلطان الاعظم المعظم المتوكل على الرحمان سكندر شاة بن فهلول شاة سلطان خلد الله ملكة و سلطانه بناكرد اين گنبذ بندة اميدوار برحمت بروردگار دولت خان *** خواجة صحمد غرة ماة رجب سنة عشرين و تسعماية ال

In the auspicious reign of the great exalted Sultán, who trusts in the All-merciful, Sikandar Sháh, son of Buhlúl Sháh, the king,—may God perpetuate his kingdom and rule!—this vault was built by the slave who hopes in the mercy of the Creator, Daulat Khán *** Khwájah Muhammad. 1st Rajab, 920. [23rd August, 1514.].

Mr. T. W. Beale, of Partábpúrah, A'grah, the learned author of the Miftáh uttawáríkh, has sent the following readings of inscriptions.

1. Bia'nah.

"There is a place of worship of the Hindús, about 1½ kos from the Qaçbah of Biánah, in the district of Bhartpúr, called "Barmádh Mátá." In the 7th year of Jahángir (مرية زماني), the daughter of Rájá Bihárí or Bhárá Mal and mother of Jahángír, caused a garden and a Báolí (a well with steps) to be built there, which cost her 20,000 Rs. At present, there is no sign of the garden, but the building which is over the Báolí still exists. It is built with red stone and has the following inscription on a slab of marble."

بعهد شاء نور الدین جهانگیر جهان شد گلشن از مهٔ تا بهاهی المحکم مادرش مربم زمانی کزو تابنده شد نور الهی مرتب گشت باغ و باولی خوش ز شرمش خلد را شد چهره کاهی خود گفت از پی تاریخ تعمیر سنه هفت جلوس پادشاهی

In the reign of the king N ú ruddín Jahángír, the world became a rosebed, from the moon to the fish.

2. By order of his mother Maryam Zamání, from whom the divine light shone forth,

3. This garden and this well were nicely built, so much so, that from shame the face of Paradise got pale.

4. Genius expressed the date of the building in the words, 'The 7th year of the Imperiul accession.' [A. H. 1022, or A. D. 1613.]

The phrase 'from the moon to the fish' is often used by poets, and is an allusion the old belief that the earth rests upon a fish; hence 'from the moon to the fish' means 'the whole earth.'

2. Ajmir.

"Jahángír writes in the Tuzuk i Jahángírí, that there is a large tank in Ajmír, and that when he visited the place in 1024 A. H., he named it

"Chashmah i Núr" ('Fountain of light') after his own name Núruddín, and ordered a building to be erected on its banks, which is still standing. The following inscription is to be seen at the top of the building, which shows the year of its erection, 1024 A. H."

بلند اقبال شاه هفت کشور و که وصف او نبیگنجد به تقریر فروغ خاندان شساه اکبر و شهنشاه زمان شساه جهانگیر درین سرچشمه چون آمدزفیضی و روان شداب و خاکش گشت اکسیر شهنشه کرد نامش چشمهٔ نور و شده آب خضر زان چاشنی گیر دهم سال از جلوس شاه غازی و بحکم پادشساه نیك ندبیر بطرف چشمهٔ نور این عمارت و جهان ارای شد از روی تقدیر خورد تاریخ انمامش رقم کود و محمل شاه نور الدین جهانگیر

1. When the fortunate king of the seven realms, whose praise cannot be expressed in writing,—

2. The light of the house of Shah Akbar, the sovereign of the time, Shah Jahangir,—

3. Came to this spring, the water flowed in consequence of his liberality, and its soil became the elixir of life,

4. The king named it 'Fountain of Light,' and Khizr's water [the water of life] derives its taste from it.

5. In the 10th year of the accession of the victorious king, by order of the well-meaning ruler,

* 6. This building at the side of the 'Fountain of Light' became, by the decree of fate, an ornament of the world.

7. Genius expressed the date of its completion in the words, 'the Mahall of Shah Núruddín Jahángír.' A. H. 1024 [A. D. 1615].

3. A'grah.

The following is the Tarikh of the famous Isma'il Beg, who was imprisoned by the Marathas in the Fort of Agrah in the time of the blind emperor Shah 'Alam, and died there in the year 1214, A. H. His tomb is still to be seen at Agrah, bearing the following inscription—

1. When Ihtisham uddaulah I s má' i l K h an left for Paradise,

A voice from heaven expressed the date of his death in the words 'Alas, a great man has gone from this world.'
 A. H. 1214 [A. D. 1799-1800].

Regarding Ismá'il Beg, vide Keene's History of the Mogul Empire, Book II, Chapter V.

The following papers were read-

 Authorities for the History of the Portuguese in India.—By-T. W. H. Tolbort, B. C. S., Miyánwálí, Bannú. (Abstract.)

Mr. Tolbort gives in this paper a list of the authors whose works are most valuable for the History of the Portuguese in India. He limits the range of these authorities to the period between 1493 when Vasco da Gama discovered India, and 1663 when the capture of Cochin by the Dutch finally broke the power of the Portuguese, and established the supremacy of other in the East. During that period the adventures of the Portuguese form a chapter of Universal History. In years subsequent to 1663, the subject, though not devoid of incidents of gallantry and romance, dwindles to one of national rather than universal interest.

The oldest work is by Correa, who came in 1512 as amanuensis to Albuquerque to India. Then follow João de Barros (died 1570), whose 'Da Asia' is looked upon as a classical work, and Couto, the continuator of De Barros, after whom the works of many other authors are described.

The author also gives references to Muhammadan writers, and notices in conclusion the Dutch and Portuguese records that still exist at Goa and other settlements, selections from which were printed between 1866 and 1869 by Sr. Rivara of Goa.

2. Notes on two Copper-plate Grants of Govindachandra of Kanouj.—By BA'BU RA'JENDRALA'LA MITRA.

The two copper plates, which form the subject of the paper, were lately discovered in the village of Basáhi in the Etawah district, and sent for notice by Mr. E. T. Atkinson, B. C. S. One of them bears date Samvat 1161 = A. D. 1103, and the other 1174. Both record grants of villages to Brahmans by Rajá Govindachandra Deva of Kanouj. The paper gives a summary of the dates of the last line of Kanouj kings from Yasovigraha to Jayachandra, the last sovereign, from whom the country passed into the hands of Moslim rulers; and notices a number of taxes and cesses which zemindars were authorized to impose on the people, including among others, a chowkidary tax, a tax on justice, a percentage on mortgages, and cesses on mines, salt-pits, mowa and mango trees, khaskhas grass, and trade in precious metals. Annexed to the paper are transcripts and translations of the two records.

8. On a new genus and species (Hylococarcinus Humei) of Land Crabe from the Nicobar Islands.—By J. Wood-Mason.

The species described in this paper is very closely allied to the members of the West Indian and Brazilian genera, Gecarcinus and Pelocarcinus, but

differs from both in that the infra-orbital lobe is not united to the front. The external maxillipeds are similar in form to those of the latter but in the mode of insertion of the three terminal joints of these appendages Hylwocarcinus differs from both genera, forming a transition from the one to the other: in Gecarcinus the third joint completely hides the terminal ones which are inserted on its inner face; in Hylwocarcinus it hides all but the external edge of the first of these joints: and in Pelocarcinus these joints are inserted at the middle of its anterior margin and are completely uncovered. In Eylwocarcinus, as in its New World allies, the dactylopodites of the ambulatory legs are armed with six rows of spines.

A male and a female were taken by the author on Treis Island, Nicobars, and another male by Mr. A. O. Hume, C. B., on Narcondam Island, Andamans.

The paper will appear in the next number of the Journal.

4. Descriptions of new species of Unionidæ.—By W. Theobald. This paper will appear in Part II, No. 4, of the Journal.

Dr. Waldie made the following brief remarks on some investigations he was engaged in, regarding the filtration of the water of the river Hughii during the rainy season—

The filtering operations at Palta for the water supply of Calcutta have, during the rainy season, been attended with great trouble and difficulty, and remedies had been proposed for this based upon experience in water filtration in England. He, the speaker, however, who had long been acquainted with the difficulty, had always maintained that it arose from a peculiarity in the water itself, and that conclusions drawn from experience with English river water were not applicable to the case. Hitherto he had not been able to support his view otherwise than by arguments drawn from the difference of circumstances in the two cases and by the actual facts observed in the filtration. A few days ago a new idea occurred to him by which he thought it probable that the nature of the peculiarity of the water might be explained, which he had immediately put to the test of experiment, and with such a satisfactory result that he intended to follow it up. and would, with permission, bring it before the Society at the first opportunity. The title of the proposed communication would probably be, "An experimental enquiry into the characteristics of the muddy water of the Hughli during the rainy season, with reference to its purification."

The President announced that there would be a recess of two months and that the next meeting would be held in the month of November.

LIBRARY.

The following additions have been made to the Library since the meeting held in July last.

Presentations.

** Names of Donors in Capitals.

Royal Society, Proceedings, Nos. 139-143.

No. 139. A. Rattray—Further experiments on the more important Physiological Changes induced in the Human Economy by Change of Climate. A. Ransome—On the mechanical conditions of the Respiratory Movements in Man.

No. 140. E. Ray Lankester—A contribution to the knowledge of Hæmoglobin, J. Norman Lockyer—Researches in Spectrum-Analysis in connexion with the spectrum of the Sun.

No. 141. J. N. Lockyer and G. M. Scabrooke—On a new method of viewing the Chromosphere. R. J. Lee —Further remarks on the Sense of Sight in Birds. W. Huggins—Note on the Wide-slit Method of viewing the Solar Prominences. Professor Owen—On the Fossil Mammals of Australia, family Macropodidæ. H. C Bastian—Note on the origin of Bacteria and on their relation to the process of Putrefaction.

No. 142. Dr W. Komalevsky—On the Osteology of the Hyppotamide. F. Guthrie—On a new relation between Heat and Electricity. H. N. Moseley—On the Anatomy and Histology of the Land-Planarians of Ceylon, with some account of their habits, and a description of two new species, and with notes on the Anatomy of some European Aquatic species. II. Aury—On Leaf-arrangement

No. 143. Rudolph von Willemöes-suhm—On a new Genus of Amphipod Crustaceans. J. D. Macdonald—On the Distribution of the Invertebrata in relation to the theory of Evolution. H. C. Bastian—On the temperature at which Bacteria, Vibriones, and their supposed Germs are killed when immersed in fluids or exposed to heat in a moist state. The Earl of Rosse—The Bukerian Lecture: On the Radiation of Heat from the Moon, the Law of its Absorption by our atmosphere and its variation in amount with her Phases. E. A. Schäffer—On the structure of striped Muscular Fibre. Sir B. C. Brodie—Note on the synthesis of Marsh-Cas and Formic Acid and on the Electric Decomposition of Carbonic Oxide. J. H. Gladstone and A. Tribe—On an Air-Battery.

Philosophical Transactions, Vol. 161, part II, and Vol. 162, part I.

Vol. 161, Part II. General Sir E. Sabine—Records of the Magnetic Phenomena at the Kew Observatory, Analysis of the Principal Disturbances shown by the Horizontal and Vertical Force Magnetometers of the Kew Observatory from 1859 to 1864. Archdeacon Pratt—On the constitution of the Solid Crust of the Earth. N. Story-Maskelyne—On the Mineral Constituents of Meteorites. H. E. Roscoe—On the Measurement of the Chemical Intensity of Total Daylight made at Cutania during the Total Eclipse of December 22nd, 1870. W. C. Williamson—On the Organization of Fossil Plants of the Coal-measures: Calamites. A. Gänther—Description of Ceratodus, a genus of Ganoid Fishes, recently discovered in the rivers of Queensland, Australia.

Vol. 162, Part I—E. G. Stone—An experimental determination of the Velocity of Sound. P. M. Duncan—On the structure and affinities of Guynia annulata, Dunc. with remarks upon the persistence of Palæozoio Types of Madreporaria. A. Macalister—The Myology of the Cheiroptera. W. C. Williamson—On the organization of the Fossil Plants of the Coal-measures: Lycopodiaceæ, Lepidodendra, and Sigillariae.

Catalogue of Scientific Papers compiled and published by the Royal Society of London, Vol. VI. (1800-1863).

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Zoological Society of London, Proceedings, 1872, March-June.

J. Anderson—On some Persian, Himalayan and other Reptiles. E. W. H. Holdsworth—Catalogue of Birds found in Ceylon, with some remarks on their habits and local distribution and description of two new species peculiar to the Island.

W. E. Brooks-On the Imperial Engles of India. Dr. J. E. Gray-On the Genus Chelymys and its allies from Australia. Major H. H. Godwin-Austen-Description of new Land and Fresh-water shells from the Khasi, N. Cachar and Naga Hills. Sir V. Prooke-On Hydropotes incrmis and its Cranial characters as compared with those of Moschus moschiferus. A. H Garrod-On the Mechanism of the Gizzard in Birds. J. Anderson-On a supposed new Monkey from the Sunderbans to the East of Calcutta, R. Swinhoe-Descriptions of two new Pheasants and a new Garrulan from Ningpo, Chiua. F. Moore-Descriptions of new Indian Lepidoptera. E. W. H. Holdsworth-Note on a Cetacean observed on the west Coast of Ceylon, A. Gunther-On the Reptiles and Amphibians of Borneo. Viscount Walden-Notice of an appendix to his memoir on the birds of Celebes. A. Anderson-Additional notes on the Raptorial Birds of North-Western India. S. J. Bowerbank-Contributions to a general history of the Spongiado, Capt T. Hutton-On the Bats of the North-Western Himalayas. Dr. J. Murie-On the Indian Wild Dog. Observations on the Macaques, I. The Bornean Ape. On the Cranial Appendages and Wattles of the Horned Tragopan.

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Geological Society of London, Journal, No. 113, February, 1873.

H. Woodward-On Eccene Crustacea from Portsmouth.

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Chemical Society of London, Journal, November 1872, to April 1873, with Supplementary Number containing Index and Title-page to Vol. X.

Novr. 1872. Professor Cannizzaro—Considerations on some points of Theoretic Teaching of Chemistry.

Sept 1873. W. C. Roberts—On the condition of the Hydrogen occluded by Palladium, as indicated by the Specific Heat of the Charged Metal. W II. Hartley—On the Standardising of Acids. E. Nicholson—Analysis of the water of the Mahanuddy.

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H. Jeula-Some statistics relating to the Traffic through the Suez Canal.

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Royal Geographical Society, Proceedings, Vol. XVI, No. 5, Vol. XVII, No. 1.

Vol. XVI, No. 5. Shaw—Central Asia in 1872. Strackey—The Scope of Scientific Geography.

Vol. XVI. No. 1. Godwin-Austen—The Garo Hills. Macdonald, Tanner, Badgley—The Lushai Expedition.

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James Fergusson—On Hiouen-Thsang's Journey from Patna to Ballabhi, and note on the same. Col. H. Yule—Northern Buddhism.—Hwen Thsang's account of the Principalities of Tokharistan. Dr. H. Kern—The Brhat Sanhitá. E. Thomas.—The Initial Coiuage of Bengal. S. Beal—The Legend of Dipankara Buddha.

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No. 56. Professor Tyndall—On the Identity of Light and Latent Heat. Dr. Gladstone—On the Crystallization of Silver, Gold and other Metals. C. W. Siemens—On measuring Temperatures by Electricity. S. Erans—On the Alphabet and its origin.

No. 57. J. N. Lockyer—On the Eclipso Expedition of 1871.—A. V. Harcourt—On the Sulphurous impurity in Coal Gas. N. Story-Maskelyne—On Meteoric Stones. Prof. Abel—On the more important Substitutes for Gunpowder. Prof. Odling—On the History of Ozone.

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W. Baines - Description of an improved apparatus for working and interlocking Railway Signals and Points,

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E. Sang—On the Computation of the Strength of the Parts of Skeleton or Open Structures Professor Tait—Laboratory notes: on Thermo Electricity. D. H. Marshall—On the relation of Magnetism to Temperature. Professor Tait—Note on a singular property of the Retina. W. J. M. Rankine—On the Decomposition of Forces Externally applied to an Elastic Solid. Professor W. Thomson—Notice of a new family of the Echinodermata. Professor Tait—Address on Thermo-Electricity. Professor W. Thomson—On the Crinoids of the "Porcupine" Deep-sea Dredging Expedition,

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J. A. Brough—On the Lunar diurnal Variation of Magnetic Declination at Travandrum, near the Magnetic Equator, deduced from Observations made in the Observatory of His Highness the Maharajah of Travancore J. H. Balfour—Remarks on the Ipecacuanha Plant as cultivated in the Royal Botanic Garden, Edinburgh, with a memorandum as to the mode of transmitting specimens to India.

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M. S. Guyard—'Abd ar-Razzâq et son traité de la prédestination et du libre arbitre.

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Rousselet—Sur les Frantçis du royaume de Bhopal.—Sur un négritto des forêts de l'Inde Centrale.

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Ehrenberg.—Üebersicht der seit 1847 fortgesetzten Untersuchungen über das von der Atmosphäre unsichtbar getragene reiche organische Leben. Ehrenberg—Nachtrag zur Uebersicht der organischen Atmosphärilien. Weber — Ueber ein zum weissen Yajus gehöriges phonetisches Compendium, das pratijnásátra.

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Abth. I. Heft 1-2. Tschermak-Die Meteoriten von Shergotty und Gopalpur.

Heft 3-5. v. Reuss—Paläontologische Studien über die alteren Tertiarschichten der Alpen. Brauer—Beiträge zur Kenntniss der Phyllopoden.

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Register zu den Bänden 61 bis 64 der Sitzungsberichte, VII.

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Pfizmaier—Zur Geschichte der Erfindung und des Gebrauches der Chinesischen Schriftgattungen. Müller—Zendstudien: III. Beitrage zur Kenntniss der Rom. Sprache: II.

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Frankl-Ein mutazilitischer Kalam aus dem 10 Jahrhundert.

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Miklosich—Uber die Mundarten und die Wanderungen der Zigeuner Europa's: I. Archiv für österreichische Geschichte, Band XLVII, (first half). Fontes rerum Austriacarum (Æsterreichische Geschicts Quellen), Abth. II. Band XXXVI.

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K. K. Geologischen Reichanstalt zu Wien. General Register der Bände XI-XX des Jahrbuches, und der Jahrgänge 1860-1870 der Verhandlungen.

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Mémoires, Tome XXXIX, 1872.

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A. Perrey—Notes sur les tremblements de terre en 1868-69 avec suppléments pour les années anterieures, de 1843 à 1868.

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Observations des Phénomènes périodiques pendant l'année 1870.

Notices extraites de l'Annuaire de l'Observatoire Royal de Bruxelles pour 1873, par le directeur A. Quetelet. Centième Anniversaire de Fondation (1772-1872), 2 vols.

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Annales Météorologiques de l'Observatoire Royal de Bruxelles, par . Adolphe Quetelet.

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THE AUTHOR.

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Baron de Chandoir—Observations sur quelques genres de Carabiques, avec la description d'espèces nouvelles.

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Société de Physique et d'Histoire Naturelle de Genève, Mémoires, Tome XXI. Parts 1-2.

Part 1. M. Antoine Morin—Matière gélatiniforme ; Albuminose, Exalbumine, Galactine.

Part 2. M. D. Colladon—Effets de la foudre sur les arbres et les plantes ligneuses et l'emploi des arbres comme paratonnerres.

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Anales del Museo publico de Buenos Aires. Entrega XI, (quinta del tomo secundo).

Climats, Géologie, Faune, et Géographie Botanique du Brésil, par Emmanuel Liais.

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Bataviaasch Genootschap van Kunsten en Wetenschappen. Tijdschrift voor Taal-Land-en Volkenkunde, Deel XVIII, serie 6, Dl. I, Afl. 2. 8. 4. Deel XIX, serie 6 and 7, Dl. I. Afl. 1-6. Deel XX. serie 7, Dl. I, II, Afl. 1, 2, 3, Verhandelingen, Deel XXXIII—XXXV.

XXXIII. J. F. C. Brumund.—Bijdragen tot de Kennis van hot Hindoeïsme.

Notulen van de Algemeene en Bestuurs-Vergaderingen. Deel VIII, Nos. 1 4, 1870. Deel XIX, 1871.

Eerste vervolg catalogus der Bibliotheek en catalogus der Maleische, Javaansche en Kawi hand-schriften van het Bataviaasch genootschap van Kunsten en Wetenschappen.

Oudheden van Java, op last der Ned.-Indische Regerina, gephotographierd van J. van Kinsbergen. (A collection of photographs of Hindoo Antiquities in Java.)

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The Christian Spectator, Vol. III, Nos. 25, 26.

THE EDITOR. .

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Major H Tulloch, R E.—On the Kennery, Toolsie, Enoor and Vehar Lake Extension projects for the Water Supply of Bombay. Capt. Allen Cunningham—On Well Foundations.

THE EDITOR.

Calcutta Journal of Medicine, Vol. VI, Nos. 5 and 6.

THE EDITOR.

Report of the Meteorological Reporter to the Government of Bengal and Meteorological Abstract for 1872.

H. F. Blanford, Esq.

A fragment of Indian History, from the Latin of Johannes de Laet. 1631, by E. Lethbridge.

THE AUTHOR.

Variétés Orientales, par Léon de Rosny.

THE AUTHOR.

Anjili ya Luka (Gospel of St. Luke, in Swaheli). Hadithiza Esopo, (Æsop's fables, in Swaheli).

HOME DEPARTMENT.

Diary of a journey from Gwadur to Karachi through Western Mekran, by Capt. S. B. Miles, Asst. Pol. Agent, Mekran Coast.

Diary of a journey from Bunder Abbas to Bagdad vid Seistan, Meshed, and Teheran, by Mr. G. Rozario, in Medical charge, Seistan Mission, 1872.

FOREIGN DEPARTMENT.

A Sketch of the History of Orissa from 1803 to 1828, with appendices, by G. Toynbee, Esq., Canal Revenue Superintendent, Cuttack.

General Report of Public Instruction in Bengal for 1871-72.

A Report on the District of Rungpore, by E. G. Glazier, C. S., Offg. Magistrate and Collector, Rungpore.

Report on the Revenue Survey Operations of the Lower Provinces from 1st Oct. 1870 to 30th Sept. 1871.

GOVERNMENT OF BENGAL.

Records of the Geological Survey of India, Vol. VI, Part 3.

Notes on a Celt found by Mr. Hacket in the Ossiferous deposits of the Narbada Valley (Pliocene of Falconer); on the age of the deposits by Mr. H. B. Medlicott; on the associate shells, by Mr. W. Theobald. W. King—Notes on the Barkkars (Coal: measures) in the Boddadanole field, Godáveri District. W. Hughes—Coal in India. W. Theobald—On the Salt-Springs of Pegu.

THE GEOLOGICAL SURVEY OF INDIA.

Voyage d'Exploration en Indo-Chine, effectuée pendant les années 1866, 1867, 1868, par une Commission Française presidée par M. le Capitaine de Frégate, Doudart de Lagrée, publié sous la direction de M. le Lieut. de vaisseau, Francis Garnier. In two volumes, with two atlases of plates.

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H. Gilmiki—Catalogue raisonné des Coléoptères, Cicindilides et Carabides, et Ch. Oberthur—Catalogue raisonné des Lépidoptères rapportés par M. Th. Deyrolle de son éxploration Scientifique en Asie Mineure, descriptions des espèces nouvolles.

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D. D. Cunningham—Translation of Prof. Max v. Pettenkofer on "Typhoid Fever: its relation to Soil water." W. J. Moore—Native practice in Rajputana. V. Richards—Experiments with Snake Poison.

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XIX, On copying Inscriptions. J. Beames—The early Vaishnawa poets of Bengal: No. 2—Chandi Dás. H. J. Stokes—Walking through Fire. E. Rehatsek—Translation of Lassen on Satrunjaya and the Jains. W. F. Sinclair—Stone and Wooden monuments in Western Khandesh.

XX. Major J. W. Watson—Story of Rani Pingla. W. F. Sinclair—List of Weapons used in the Dekhan and Khandesh. G. H. Damant—Inscriptions on a Cannon at Rangpur. F. J. Leeper—The Naladiyar. Rev. M. Phillips—Tupuli in the Salem District. W. F. Sinclair—Notes and Legends connected with Animals II. J. A. May—Notes on the Bhondas of Jaypur.

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Hindoo Tales, translated from the Sanskrit of the Dasakumaracharitam, by P. W. Jacob.

The Life of H. T. Colebrooke, by Sir E. T. Colebrooke.

Viae et Regna, descriptio ditionis Moslemicae, auctore Abu'l-Kasim Ibn Haukal, (Part II, of M. J. de Goeje's Bibliotheca Geographorum Arabicorum).

Ein Mutazilitischer Kalâm, aus dem 10. Jahrhundert, von. Dr. P. F. Frankl.

Zur Characteristik Galál-ud-dín us-Sujútís und Seiner Literarischen Thätigkeit, von Dr. Ignez Goldziher.

Ceremonia apud Indos, quae vocatur jâtakarma, by J. J. Speijer.

Wörterbuch zum Rig-Veda, von Hermann Grassmann, Part II.

Die Verwantschaftsverhältnisse der Indogermanischen Sprachen, von Johannes Schmidt.

Grammaire de la Langue Mandchou, par Lucien Adam.

Rhetorique et Prosode des Langues de l'Orient Musulman, par M. Garcin de Tassy.

Abhandlung zur zerstreuung der vorurtheile über das alte und neue Morgenland, von H. Ewald.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.
 Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.
 Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	ight omet aht.	Range o	f the Bar ing the da	ometer 1y.	ry Bi omete	Rango d ture d	of the Tem uring the c	pera- lay.
Date	Mern Height th; Baromet at 32° Faht.	Max.	Min.	Diff.	Mean Dry Br Thermomete	Max.	Min.	Diff.
	1	Inches.	Inches.	Inches	o		0	
	Inches.			0.117	85.2	917	82.0	9.7
1	29.561	29.605	$29.488 \\ .517$	0.117	83.7	87.5	81.0	65
2	.556		.517 .507	101	83.0	87.0	80.5	6.5
3	.563	.608	.437	.111	85.1	87.4	80.0	7.4
4	.509	.518 .534	.425	.109	815	85.8	79.2	6.6
5	.493	.515	.414	.101	83.0	87.0	79.4	7.6
6	.474	.568	,430	.138	83.8	914	80.5	10.9
7	.481 .522	.565	456	.109	83.8	87.5	81.0	65
8	.478	.525	.428	.097	83.5	88.1	81.4	7.0
9 10	.459	.503	.394	.109	84.8	92.0	80.2	11.8
11	,459	.506	.406	.100	83.3	90.0	80.5 80.0	9.5 7.0
12	.426	.479	.357	.122	82.4	87.0	80.5	8.1
13	387	.429	.317	.112	82.8	88.6	79.6	3.4
14	.427	.507	.371	.136	81.3	83.0 89.0	79.5	9.5
15	.491	.528	.431	.097	$82.6 \\ 84.0$	88.5	81.0	7.5
16	.473	.515	.403	.112	84.5	91.0	81.0	10.0
17	.429	.491	.364	.130	80.5	82.2	79.5	2.7
18	.299	.401	.194	.210 .149	83.6	89.3	79.5	9.8
19	.379	.463	.314	.101	85.5	90.2	82.0	8.2
20	.461	.521	.417	.075	84.2	91.0	81.8	9.2
21	.512	.552	.477	147	85.6	92.0	81.0	11.0
22	.498	.559	.412 .386	.117	83.4	87.6	81.0	6.6
2 3	.453	.503	.360	.118	83.6	88.8	80.6	8.2
24	.466	.528	.456	.100	83.9	88.5	80.3	8.2
25	.516	.565	.441	.130	85.1	90.3	81.8	8.5
26	.513	.571	426	.089	82.4	84.5	80.5	4.0
27	.468	.515 .577	462	.115	81.1	86.0	77.5	8.5 9.5
	.511	.615	.5	.106	81.8	87.0	77.5 80.2	9.1
	.559	.616	.525	.091	81.4	89.3	80.2 80.5	5.3
30	.585 .559	.597	.499	.098	83.0	85.8	80.0	5.6
31	600,	1 .001		<u>.</u>	an likow	ise the D	ry and We	t Bulb

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of July 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

					1			
Date	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew	Mean Elastic force of vapour.	MeanWeight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humi- dity. complete satu- ration being unity.
	0	0	o	. 0	Inches.	T. gr.	T. gr.	:
123456789111231445671123144567112314456711231445671123223245256272881	81.5 80.6 80.5 80.1 80.3 81.1 81.6 81.2 81.2 80.5 81.2 81.2 80.5 81.2 81.2 80.8 81.2 79.0 80.8 82.2 82.1 79.6 80.8 82.2 81.2 81.2 81.3 80.5 80.8 82.2 81.3 80.5 80.8 82.2 80.5 80.8 80.8 80.8 80.8 80.8 80.8 80.8	3 7 3 1 5 5 5 1 4 2 5 5 5 1 4 2 .7 7 2 .2 2 2 .6 6 2 .1 9 1 .6 6 2 .2 2 .4 6 2 .6 3 .7 2 .8	78 9 78 4 78.7 78.8 79.1 79.2 80.1 79.2 80.1 79.5 80.3 80.4 79.0 78.8 79.9 80.6 79.5 79.7 79.5 79.7 79.5 79.7 78.4 77.4 78.1 78.2	6.3 5.3 4.3 4.6 4.6 3.7 6.1 3.6 3.2 2.4 3.1 3.7 4.1 4.8 5.8 6.1 3.7 4.1 4.8 5.8 6.1 4.4 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1	0 967 .952 .961 .963 .973 .952 .976 1.005 0.995 .961 .992 .976 1.011 .014 0.970 .964 .998 1.021 0.986 .992 .986 .986 .986 .979 .992 .952 .952 .952 .952 .948	.21 .45	2 27 1.86 .49 .50 0.82 1.61 .65 .35 .34 2.17 1.30 .11 0.98 .35 .50 0.52 1.69 2.07 1.32 2.23 1.33 .46 .56 2.11 0.95 .92 1.47 2.21 1.67	0.82 .85 .87 .88 .89 .89 .90 .92 .91 .89 .89 .88 .89 .89 .88 .89 .88 .89 .88 .89 .88 .89 .88 .89 .88 .89 .88 .89 .88 .89 .89

All the Hygriometrica elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1878.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

Ηo	Heigh romet Falr	for e	of the Ba ach hour the montl	during	Mean Dry Bulb Thermometer.	ture	Range of the Tempera- ture for each hour during the month.			
	Me. he	Max.	Min.	Diff.	Mean	Max.	Min.	Diff.		
31:1	Inches.	Inches.	Inches.	Inches.	. •	! ! •	•	0		
Mid- night	29 509	29 609	29 335	0.274	81 7	83.9	77.6	6.3		
1	195	.603	.325	.278	81.5	83 5	77.5	6.0		
$\hat{2}$.183	.598	.321	.277	81.3	83 2	77.5	5.7		
3	.17 i	.590	.314	.276	81.1	82.8	77.8	5.0		
4	.161	.583	.323	.260	80.9	82.6	77.9	4.7		
5	.475	.(300)	.339	.261	80 7	82.5	78.0	4.5		
6	.486	.602	.341	.261	80.8	82.8	78.5	4.3		
7.	.498	.614	.323	.291	81.1	81.0	79.5	4.5		
8	.511 ,	.612	.332	.280	82.6	81.8	80.5	4.3		
9	.516	.615	.312	.303	810	87.0	80.0 81.0	7.0		
10	.518	.616 ,	.311 .291	.305 .325	85.0 85.8	88.0 90.0	80.7	7.0 9.3		
11	.509	.616	.201	.320	60.6	30.0	80.7	9.3		
Noon.	.491	.596	.260	.336	86.6	91.7	80.8	10.9		
1	.475	.580	.231	.319	86.9	91.0	80.2	10.8		
2	.458	.559	.204	.355	86.7	91.6	81.5	10.1		
3	413	.544	.197	.347	86.2	92.0	81.5	10.5		
4	.430	.538	.191	.344	85.8	91.5	81.0	10.5		
5	.431	.525	.211	.314	85.1	88.8	79.5	9.3		
6	.412	.539	.224	.315	84.2	88.6	77.7	10.9		
7	.462	.561	.261	.300	83.3	86.7	77.5	9.2		
8	.483	.582	.293	.289	82.8	86.0	77.5 77.5	8.5 7.6		
9	.504	.595	.326	.269	82.4 82.1	85.1 84.7	77.5	7.0 7.2		
10	.517	.607	.344	.263 .276	81.9	84.2	77.5	6.7		
11	.517	.615	.339	.270	01.0	, .				

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations tuken at the Surveyor General's Office, Calcutta, in the month of July 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

			pendeno		Continu			
Hour.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Pry Bulb above Dew Point.	Mean Elastic force of Vapour	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	. 0	•	o	o	Inches.	T. gr.	T. gr.	!
Mid- night. 2 3 4 5 6 7 8 9 10	80.1 80.2 80.0 79.9 79.7 79.6 79.7 80.8 81.3 81.7 81.8	1 3 1 3 1 3 1 2 1 12 1 11 1 12 1 12 1 18 2 27 3 3 3	79.5 79.1 79.1 78.9 78.9 79.4 79.5 79.4 79.0	2.2 2.2 2.2 2.0 2.0 1.9 1.9 2.0 1.9 2.0 3.1 4.6 5.6 6.8	0.986 .979 .973 .973 .967 .964 .964 .983 .986 .983 .983	. 10.62 .55 .49 .43 .43 .40 .43 .58 .60 .51 .49	0.75 .76 .75 .75 .67 .64 .61 .69 1.08 2.01 .48	0.93 .93 .93 .94 .94 .94 .91 .91 .91 .91
Noon. 1 2 3 4 5 6 7 8 9 10 11	82.2 82.4 82.4 82.0 82.0 81.6 81.0 80.9 80.7 80.6 80.6 80.6	4.4 4.5 4.3 4.2 3.8 3.5 3.2 2.1 1.8 1.5 1.4	79.6 79.7 79.8 79.1 79.3 79.1 78.8 79.2 79.2 79.3 79.5 79.5	7.0 7.2 6.9 7.1 6.5 6.0 5.1 4.1 3.6 3.1 2.6 2.4	.989 .902 .995 .973 .979 .973 - .961 .976 .976 .979 .986	.51 .57 .60 .38 .41 .40 .31 .48 .53 .60	.60 .68 .58 .61 .39 .17 1.90 .45 .27 .08 0.91 .82	.80 .80 .80 .81 .83 .85 .88 .89 .91

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of July 1873.

Solar Radiation, Weather, &c.

	Max. radia	Rain Gi .½ ft. ai Groui	Prevailing direction.	ı 🗗	Daily elocity	General aspect of the Sky.
-	137.5	Inches 0.09	ESE&S by E	lb 0.2	123.0	O to 5 A. M. S to 8 A. M oi to 6 P. M., \i & \i to 11 P. M. Light R between 5 & 6, at 12\frac{1}{2}
i i	132.5	0.13	SE&SSE	0.7	163.9	A. M., & 61 P. M. S to 6 A. M., i to 6 P. M., i to 11 P. M. T at 61 A. M. Slight
1	134.0	0.51	SE&SbyE	1.0	117.5	R at 6, 9, 10, a. m. & 1 P. m. B to 6 A. M., i to 5 P. M. to 9 P. M. S to 11 P. M. T between 12 A. M., & 1 P. M. Slight R be-
4.	130.0	0.16	SE&S	0.5		tween 9 & 10 at 12½ A. M. 1½ between 3 & 4 & at 10½ P. M. i & i to 6 A. M., i to 9 P. M. O to 11 P. M. Tat 4½ P. M.
		0.42	S & S E	1.2	126.2	Slight R at 10\frac{1}{2} A. M., 2\frac{1}{2}, 9\frac{1}{2}, 10\frac{1}{2} & 11\frac{1}{2} P. M. O to 11 A. M., \(\cap \) i to 6 P. M., \(\cap \) i to 11 P. M. Slight R between 1 & 2, at 6\frac{1}{2}, 9\frac{2}{3}, 10\frac{1}{2} A. M., be-
6	131.0	0.04	\mathbf{s}		115.8	tween 1 & 2 & at 3\frac{1}{2} P. M. B to 2 A. M. O to 8 A. M., \(\sigma\)i to 5 P. M., \(\sigma\)î to 11 P. M. Light
7	144.5	0.35	SSELS	2.8	36.0	R at 5, 7 a. m., & 1 p. m. i & i to 2 a. m. O to 8 a. m. i to 4 p. m., i to 9 p. m. S to 11 p. m. Slight R at 5 4, 6, 7 a. m.
8	132.0	0.42	ESE&SE		158.1	2½ & 4½ P. M. i to 3 A. M. O to 6 A. M., i to 4 P. M. S to 11 P. M. R at 8½
9	147.0		S&SSE		66.9	from 12\frac{1}{4} a.m. 2, at 4\frac{1}{3} & 5\frac{1}{3} p.m. O to 1 a.m., \(\) i & \(\) i to 4 a.m., \(\) i to 12 a.m. O to 4 p.m.
10	139.0	0.41	S by E & S W		112.9	i to 11 p. m. T between 1 & 2 p.m. D at midnight 2½ & 4 p.m. i to 2 a. m., i to 8 a. m., i to 3 p. m. O to 11 p. m. T be- tween 5& 6 and at 11½ p.m. Lat 11p.m. Slight R from 5 to 11½p.m.

[\]i Cirri,—i Strati. ^i Cumuli, ∟i Cirro-strati, へi Cumulo-strati, ∖ i Nanib, √i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning. R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1873.

Solar Radiation, Weather, &c.

WIND.	
Date. Max. Sola radiation and direction of Ground. Ground.	A General aspect of the Sky.
0 Tuches 11 141.3 0.52 SW&SSW	Mile. O to 11 A. M., ai to 2 P. M. O to 11 P.M. Lat midnight, 3 A.M. & 11 P. M. Slight R after inter-
12 134.5 1.10 S S W & Variable 0.8	11 P. M. L from midnight to 2
13 137.8 0·10 SSW&SW	11 to 3 P. M. 47.6 Chiefly O. Slight R at 1, 13, 21 & 5 P. M.
14 0.19 S W & W S W	13.9 Chiefly O. Slight R after in-
15 141.0 0.16 S W	tervals. 148.0 Clouds of different kinds. T at 3½ & 8 P. M. L at 8 P. M.
16 128.0 0.07 SW&SSW	Slight R after intervals from 10 h. m. 31.4 B to 2 A. M., i to 5 A. M., i to 10 A.M., O to 2 P.M. i to 6 P.M. S to 11 P. M. Light R. on 10 h. A.M. 2 & between 6 & 7 P.M.
17. 142.0 0.48 Variable 1.0	97.6 S to 5 A. M., at to 3 P. M. O to 11 P. M. T at 3 & 9 P. M. Slight R at 3, 114, 124 A. M.,
18 1.80 N N E & Variable	3½, 4½ & 8½ P. M. 184.0 Chiefly O. T at 2 P. M. R
a-1	230.0 O to 5 A. M., i to 10 A. M., i to 8 P. M. B to 11 P. M. L on
20¦ 140.0 0.07 S S W	an W at 8 p. m. R at midnight. 193.3 S to 4 A. M., \(\subseteq \text{i to 6 A. M.,} \) o i to 7 p. m. B to 11 p. m. T at
21 138.0 0.66 SSW&S by W	2½ r. m. Slight R at 3½ r. m' 92.2 S to 9 a. m, \in i to 3 r. m. O to 6 r. m., \id \in i to 11 r. m T from 1 to 4 r. m. R at 1 & 4½ r. m.

i Cirri,—i Strati, ^i Cumuli, Li Cirro-strati, Li Cumulo-strati, Li Nimbi, Li Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning B. rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, Sin the month of July 1873.

Solar Radiation, Weather, &c.,

		ige ove	WIND			
Äl	Max. Sol	an Guage transfer transference	Prevailing direction.	Max	Daily Velocii	General aspect of the Sky.
22	137.0	Inches	SbyW,E&EbyN		60.6	S to 4 A. M., \io to 7 A. M., \i to 10 A. M., \io to 7 P. M., \io 11 P. M. Lon Wat 8 P. M. Dat
23	128.5	0.33	E by N & E	0.8	165.2	louds of Different kinds to 11. M. T between 11 & 12 a. M. L. at 9 & 10 p. M. Slight R after
24	138.8	0.38	E & S	1.4	219.4	to 6 P. M. B to 11 P.M. T at 121. A. M. R between 11 & 12 A. M.,
25	138.7	0.02	SSE,SSW&Sby	0.4	203.8	Light R at $2\frac{1}{2}$, $3\frac{1}{2}$, $10\frac{1}{2}$ 11 & 12
26	134.0	<i>.</i>	SSW&SW	0.8	157.5	O to 11 P. M. L from 7½ to 11 P. M. D at 2½, 3½ A. M. R at 11
27		*2.05	s w.		157.0	from 14 to 5 A. M. Lat 2 A. M.
2 8		3.26	s w	2.0	111.3	R from midnight to 12 A. M. i and i to 4 A. M. O to 11 P. M. T at 51 P. M. D at 51 A.M.
2 9	130.0	0.73	w & s w	3.5	203.3	R from 1½ to 11 P. M. Chiefly O. Slight R from mid. night to 6 A. M., at 2 & between 7 and 8 P. M.
80	136.5		SW&SSW	1.2	197.4	
31	95.2		S W & S		107.0	CTT - C - C

^{\`}i Cirri —i Strati, ^i Cumuli, ∟i Cirro-strati, ~i Cumulo-strati \wi Nimbi, \wi Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

^{*} Fell on the 26th and 27th.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of July 1873.

MONTHLY RESULTS.

		Inches.
Mean height of the Barometer for the month		29.483
Max. height of the Barometer occurred at 10 and 11 A.M. on the		
Min. height of the Barometer occurred at 4 P. N. on the 18th		29.194
Extreme range of the Barometer during the month		0.422
Mean of the daily Max. Pressures		29.536
Ditto ditto Min. ditto	•••	29.422
Mean daily range of the Barometer during the month		0.114
the day of the Datement daring the month	***	OILLE
~ 2		
36 D. D. H. M		.0
Mean Dry Bulb Thermometer for the month	•••	83 4
Max. Temperature occurred at 3 r. m. on the 10th and 22nd	1.00.1	92.0
Min. Temperature occurred at 10 P.M. and 2 A.M. on the 28th an	a 29th	77.5
Extreme range of the Temperature during the month	•••	14.5
Mean of the daily Max. Temperature	•••	88.2
Ditto ditto Min. ditto,	•••	80.4
Mean daily range of the Temperature during the month	•••	7.8
Mean Wet Bulb Thermometer for the month		80.9
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermome	eter	2.5
Computed Mean Dew-point for the month	•••	79.1
Mean Dry Bulb Thermometer above computed mean Dew-point		4.3
		iches.
Mean Elastic force of Vapour for the month	10	0.973

	Troy g	rain.
Mean Weight of Vapour for the month		10.45
Additional Weight of Vapour required for complete saturation	•••	1.51
Mean degree of humidity for the month, complete saturation being	e mnite	
Mean degree of numidity for the month, complete saturation being	unity	0.02
		1B
Mean Max. Solar radiation Thermometer for the month	***	135.0
	In	ches.
Rained 30 days,-Max. fall of rain during 24 hours		3.26
Rained 30 days, -Max. Iall of rain during 24 hours	•••	14.76
Total amount of rain during the month Total amount of rain indicated by the Gauge* attached to the an		14./U
	omo-	13.60
meter during the month	& 8. S	
Prevailing direction of the Wind S. W	OC 10. 10	. ** .

^{*} Height 70 feet 10 inches above ground.

Abstract of the Bosults of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of Iuly 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour. when any particular wind was blowing, it rained.

Rain on. W. by W. Rain on. W.W.W. .no niaM W.W. Rain on. .W.N.W no giast W. by M. Rain on. .W Rain on. W. by S. Rain on. HH-88 H-188 8 8 4448444 .W.3.W Rain on. 'M 'S Rain on. FIRST 0000 0 40 +000 W .8 .8 .no nui M S. by W. .no niasI Rain on. a by K. 01 01000000 Rain on. ⊶ັດ∛ັຕິ້ ຕັ S. S. E. S. S. E. Ram on, E 8 E dain on. 16. by S. no must H. 20222 Rain on. E. by M. Rain on. E. N. E. N. E. Rain on. N. N. E. Rain on N. by E. Rain on Mid night Hour.

PROCEEDINGS

OF THE

ASIATIC SOCIETY OF BENGAL,

FOR NOVEMBER, 1873.

The Monthly General Meeting of the Society was held on Wednesday, the 5th instant, at 9 o'clock P. M.

Col. Hyde, R. E., President, in the chair.

The minutes of the last meeting were read and confirmed.

The following presentations were laid on the table-

1. From the Royal University of Norway, small collections of Minerals and Coleopterous insects, also a Medal issued by the University in commemoration of the Millenary Jubilee celebrated 18th July, 1872, in the Kingdom of Norway, which Kingdom was constituted by the king Harald Haarfager in the year A. D. 872.

The President remarked that no list or description of the minerals had been received, but they would be sent to the Superintendent of the Geological Survey for classification and afterwards deposited in the Museum.

- From Bábu Yadavachandra Mukerji, a large palm-leaf MS. of the Rámáyana, Ayodhyakanda found floating in the river Húgli, at Kamarhati.
- 3. From Sirdar Attar Sing Bahádur, a copy of Sakhee Book or description of Gooroo Gobind Singh's Religion and Doctrines.

From Eroud Tamoorus Deenshah Unclaschariah, Editor of "Shavuk Nameh," through Mr. B. Cowasjee, a copy of his Gujrati Poetry.

4. From Col. Guthrie, a cast of a Bengal coin of Firuz Shah the Second.

Mr. Blochmann said :-

This east is taken from an apparently unique silver coin in the British Museum. The coin was struck by Saifuddin Abul Muzaffar Firúz Sháh-(II.) of Bengal, in 893 A. H. I have collected what little there is known of this king in my "Contributions to the History and Geography of Bengal."

5. From H. Beveridge, Esq., C. S., a copper-plate inscription found at Bakirganj.

The following letter accompanied the donation-

"The copper plate was found in May last by one Ram Kumar Bhismali while he was digging a tank at the village of Brahmandi in the north of this district and not far from the Madaripur bazaar. It was found at a depth of eight or ten cubits under the earth. It is supposed that the plate belonged to the Roy family, who first settled in Brahmandi. The place where it was found is near the house of Sám Sundra Rai, who is the only surviving descendant of the family. No one here can decipher the inscription. I am indebted for the possession of the plate and for the above particulars to one of my Deputy Collectors, Babu Hari Mohan Sein.

The following gentlemen are candidates for ballot at the next meeting. J. Sykes Gamble, Esq., Assistant Conservator of Forests, Silligoree, proposed by S. Kurz, Esq., seconded by Dr. W. Schlich.

His Highness the Maharaja of Johore, K. C. S. I., K. C. C. I., proposed by Mr. J. Wood-Mason, seconded by the President.

M. L. Dames, Esq., C. S., Assistant Commissioner, Karnál, Panjáb, proposed by J. Delmerick, Esq., seconded by D. C. Ibbetson, Esq., C. S.

Bartle O'Brien, Esq., M. D., proposed by Mr. J. Wood-Mason, seconded by Dr. V. Richards.

- J. Elliott, Esq., M. A., Professor of Mathematics in the Muir Central College, Allahabad, proposed by Mr. A. S. Harrison, seconded by Captain J. Waterhouse.
- J. Blackburn, Esq., proposed by D. Waldie, Esq., seconded by Captain J. Waterhouse.

Kenneth McLeod, Esq., M. D., Secretary to the Surgeon General, Indian Medical Service, proposed by H. F. Blanford, Esq., seconded by C. Tawney, Esq.

The following gentlemen have intimated their desire to withdraw from the Society:—

The Hon'ble Sir R. Couch, Kt.

H. Woodrow, Esq.

Col. G. H. Saxton.

Col. B. Ford.

Sultán Muhammad Bashiruddin.

Mr. Wood-Mason exhibited a specimen of Carcinus manas, Pennant, taken in 1866 or 67 at Point de Galle Ceylon by Dr. J. Anderson. Comparison of this specimen with those from the Mediterranean lately received from Prof. Cornalia of Milan had enabled him to be sure of the correctness of his previous identification from the published figures and descriptions. The species appeared to have an exceedingly wide distribution, being to be found

in abundance on the shores of the British Isles, and of the United States whence it extended to the Arctic Sea, and on all the Mediterranean coasts: it had also been recorded by Heller from Rio Janeiro, and specimens would doubtless ultimately be met with in the Red Sea.

The President announced that the Council had appointed Mr. A. Pedler a member of the Physical Science and Library Committees.

The following papers were read-

1. Notes on Aquila navioides, A. fulvescens and A. vindhiana. By W. E. Brooks, C. E.

Having received from my friend, the Rev. Dr. Tristram, an African example of the true Aquila nævioides, Cuv., I am in a position to state that the Indian bird hitherto known under that name is quite a different species, viz.—Aquila fulvescens, Gray, as is clearly shewn in Gray and Hardwicke's "Illustrations of Indian Zoology."

Our Indian species can easily be distinguished from the African bird: 1, by its small round nostril, and 2, by its plain black unbarred tail. The nostril of the African bird is long and vertical, like those of A. vindhiana, A. mogilnik, and A. bifusciata. Its tail also, is a well-barred one, in character like that of A. vindhiana.

Some years ago, I sent two of the rare A. fulvescens to England for identification; the one a buff or tawny immature bird, and the other a dark rufous brown adult. By the English ornithologists they were pronounced to be identical with the African A. navioides; and as such were accordingly entered in our Indian lists. Dr. Jerdon also accepted the identification.

I am glad to have been able at last to find out the mistake, and so to re-establish the fine species so long suppressed on account of its supposed identity with another species. It will be remembered that another species of the same author, A. bifasciata, has also been restored to its rightful place, after having been for years confounded with A. mogilnik (A. imperialis).

The term A. fulvescens has been erroneously applied, as Mr. Gurney first pointed out to me, to our common Wokhab, whose correct name is A. vindhiana, Franklin: a glance at the plate of A. fulvescens in Gray and Hardwicke's work sufficing to shew not this only, but also that the species intended is the rare one hitherto confounded with A. navioides. A. fulvescens, by its roundest of round nostrils and plain black tail, is at once distinguished from the other two in any stage of plumage: it has tawny immature plumage and a dark red-brown adult one.

A. nevioides has also a tawny plumage and a darker brown one. Its

fine rich warm colours will at any time separate it from the dull-coloured Indian Wokhab, A. vindhiana.

A. vindhiana has a light and a dark plumage; but the light one is merely a pale whity-brown; and this pale plumage instead of being characteristic of immaturity is on the contrary the plumage of the adult bird, as far at least as my observations go. I have repeatedly shot these old whity-brown birds from the nest. Some examples fade more than others, and I believe this pale plumage to be more the result of the colour not being fast than the mark of any particular age. I have in one and the same species, viz., in Aquila nævia, examples almost black, and others pale sandy brown; so widely different, in fact, are examples of the two extremes of coloration that any one not acquainted with the characters of the species would be much perplexed.

I should observe that A. fulvescens is only a cold weather visitant to the plains of India, while A. vindhiana and A. navioides are non-migratory species.

I append a description of the specimen of A. nævioides, as it may prove useful.

Aquila nævioides, Cuvier.

Whole body plumage, from head to tarsus, a rich light reddish brown or tawny; on the breast and sides are some feathers with part of one web patched with purple brown; wing coverts, both lesser and greater, a mixture of very pale and dark brown, varied with tawny, the pale colour predominating and occupying the margins of the feathers, scapulars and inter-scapularies, rich purple brown, with tawny terminal stripes to each feather; giving the bird a very striped appearance about the shoulders and mantle; primaries blackish, but paler and barred on their inner webs towards the bases: secondaries lighter and pale-tipped, being very conspicuously barred on both webs; tertials still paler, and well-barred on both webs; lining of wing light reddish brown; axillaries the same; lining-feathers under tertials nearly pure white; tail hoary brown, barred in the same manner as that of A. vindhiana. There is no conspicuous pale tip. The evebrow is very distinct and black, much blacker and better marked than in either of the other eagles referred to in this paper. The tibial and tarsal plumes are long and fine, and of as bright a red or tawny, as any other part of the body; the lower tail coverts are also of the same bright tawny red. One peculiar characteristic of this eagle is the strong purple gloss on the brown of the scapulars and upper wing coverts. The nostril is a long vertical one as in A. mogilnik and A. vindhiana, and also similar to that of A. bifasciata.

This is one, and the well known stage of this eagle's plumage, but it

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has also another of a darker brown, as shewn in the illustration of the 'Ibis' for April 1865.

Length about 26 inches; wing 19.75; tail 10.5; bill at front 2 in.; from gape 2.4; height at base 1.12; tarsus 3.25; mid toe and claw 3 in.; hind do. 2.25; bill dark horny, bluish grey at base; cere apparently bright yellow; feet the same; claws black.

Hab.—Great Namaqua Land.

- 2. Notes on the Certhinæ of India.—By W. E. Brooks, C. E. The author recognizes five species two of which are described as new. The paper will appear in the forthcoming number of the Journal.
- On the Muddy Water of the Hugli during the rainy season with reference to its purification and to the Calcutta Water-supply.—By D. Walde, Esq., F. C. S.

Abstract.

The author commenced by referring to a long series of experiments made by him in 1868 and 1869 on the best kind of sand to be used in the filters at Palta for the supply of water to Calcutta, and on the merits of a particular contrivance called Spencer's Regulating Cup proposed to be used in these filters and alleged to be of great value in filtration. His enquiries resulted in the condemnation of that cup as possessing no special advantage over other plans for producing the same effect that it had, and in his recommending the employment of a finer sand than that used generally in England. for the filtration of the Hugli water during the rainy season, during which period it is attended with peculiar difficulty. It had been found of late, as the demand for water increased, that the difficulty in supplying it had become very serious. This difficulty had been treated as a failure of the plan adopted, which had been condemned on account of its departure from the principles of filtration recognised in England; and it was proposed to remedy this by reverting to practice founded on these principles and more especially to the use of the Regulating cup.

The author on the other hand maintained the correctness of his results and conclusions, and contended that the proposals just mentioned were founded upon principles fundamentally erroneous, because the real source of difficulty lay in the peculiar quality of the river water during the rains, which caused it to penetrate deep into the sand in a way which English waters similarly treated did not do. He connected this peculiarity with the large rainfall, limited to four or five months of the year, though he could not with certainty explain the reason why it did so. Nevertheless he firmly adhered to it as a fact.

About the 1st of August last, an idea suggested itself to him of a cause by which possibly the peculiarity might be accounted for, and a reference

to experiment shewed that it was correct. The difficulty in the settling of the mud arises from the great state of dilution of the water. Some facts had been long observed by chemists bearing more or less directly on the subject, and special observations had been made, particularly by Skey and Schloesing, on the separation or precipitation of mud from water; a consideration of all these things suggested that if the deficiency of saline matter in the water of the rains was made up by the addition of such matters to it, so as to bring the water up to the standard of that of December or January, the mud would then settle much more readily and possibly be so much altered as to enable the water to be filtered easily. This was found by experiment actually to be the case. The saline matters in the water act as precipitants of the mud if in sufficient quantity: during the rains they are not in sufficient quantity, if doubled they are. Assuming 7 grains of Carbonate of Lime (in solution) as equivalent to the salts of Lime and Magnesia in 100,000 grains of the Húgli water at its extreme degree of dilution, the addition of an equal quantity of Carbonate of Lime (in solution) or of Carbonate of Magnesia (in solution) or of Sulphate of Lime precipitates the mud well. Double the equivalent of Chloride of Calcium is requisite as it has only half the efficacy. The alkaline salts have comparatively little influence. The salts of lime and magnesia, particularly the carbonates, held in solution by carbonic acid, are the chief active ingredients in producing the effect. They cause the very fine particles of clay to coalesce and aggregate into larger and denser ones which in the course of 24 to 48 hours settle well, and the water can then be filtered easily. The clay has been said to be coagulated and the term seems appropriate.

Corroborative evidence has been found in the peculiarities of some river waters on the European continent, particularly those of Alpine origin, which are liable to occasional unusual dilution and accompanying muddiness, such as the Garonne, from which Marseilles is supplied. A peculiar system of filtration is employed there, appropriate to the purpose. The river waters in England are liable to no such extreme changes, consequently their muddy water has no such peculiarities or only to a comparatively small degree.

It was found on extending the enquiry that acids, alkalies and alkaline carths, and many other saline substances possessed the same property, and many of these to a much greater degree. Thus salts of Manganese and Copper and protosalts of Iron are effective in considerably smaller quantities than salts of Lime and Magnesia, and salts of the sesquioxides, namely, Alumina and peroxide of Iron are the most effective of all. Tables are given in the paper shewing approximately the quantities of these substances necessary or sufficient to produce the same effect. The differences in power between common salt and Lime salts, and between Lime salts and Ferric salts are very great.

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Thus for instance taking Carbonate of Lime dissolved by excess of Carbonic acid as the standard, Sulphate of Lime is about equally effective, common salt and alkaline salts generally have only about one-twentieth part of the power, Protosulphate of Iron has about six times the power and Persulphate or Perchloride of Iron about forty times the power, so that a very small quantity of persalts of Iron is sufficient. It is to be understood that with the minimum quantities employed a period of from 24 to 48 hours was always given to produce the effect. The quantities necessary are only given as approximations, and there is more doubt connected with those for the salts of the heavy metals and sesquioxides than with those of the earths and alkalies, because, on account of the early cessation of the rains, the river water began to lose its peculiar difficulty in clearing while these salts were being experimented on. The comparison is therefore not so much to be depended on, but the differences in relative power are much greater than had been previously noticed by other observers; this, at least, in their application to this particular water.

The author had quite recently met with Schloesing's original paper which previously he had seen only very briefly and imperfectly abstracted, and found that Schloesing's results were very similar to his own, and that he also suggested similar means for treating highly diluted muddy water difficult to settle, namely, that of restoring it to its natural condition by the addition of Lime salts or other of its normal constituents. But he did not push the enquiry further. The extension to other salts and the discovery of the very small proportion of salts of Alumina and Peroxide of Iron, particularly of the latter, that are sufficient when an interval of 24 to 48 hours is given for settling, to purify the water, so that it can be filtered easily, greatly favours the probability of the application of the principle in practice.

Details are given in the paper.

Mr. Blanford said he had listened with much interest to Mr. Waldie's account of his investigations into the action of salts in solution, in facilitating the precipitation of matter mechanically suspended in the water. Mr. Pedler had found that, by adding to the water a quantity of lime equal to that in solution, and precipitating the whole as insoluble calcium carbonate, (a well known method of softening hard water) the suspended matter, however fine, was carried down with the precipitate but the process described by Mr. Waldie appeared to rest on some different principle, which yet remained to be clucidated. With respect to the regulating cups, which he understood had not been tried by Mr. Waldie, he thought it would have been more satisfactory if he had experimented upon them before utterly condemning them. Looking at the question from an a priori point of view, it certainly seemed that an upward filtration is likely to be more effectual in removing fine matter in suspension than the downward method; and he knew that Mr. Clark had much confidence in these cups.

Dr. Waldie then exhibited one of the Spencer's cups and explained that the water was completely filtered before it reached the cups and so there could not possibly be any upward filtration; all that the cups could do was to prevent more than a certain quantity of water passing in a given time, which could be done equally well or better by other arrangements. The cup had been actually tried during the whole rainy season of 1869 and the conclusions come to had been derived from these experiments.

Mr. II. B. Fenwick C. E., in charge of the Water Works at Palta, gave a brief description of some experiments made with the Spencer's cups which proved conclusively that they would not answer the purpose intended.

Mr. Fenwick said, that at Mr. Clark's suggestion he had tried the cups; 'a filter $12' \times 12'$ was constructed at Palta fitted with four of Spencer's regulating cups and was supplied from the same source as the large filters. The discharge was found to be in proportion to that of the large filters as 3 to 1; the materials were then removed and four of the holes in each regulating cup stopped up, the discharge then amounted to $2\frac{3}{4}$ to 1; two more were then stopped up, thereby reducing the original ten holes to four meach cup, and the discharge was then 2 to 1 in proportion to that from the large filters. During the rainy season the water which flowed from this filter was very much inferior in transparency to that from the large filters during the same period, in fact it was very inferior to that from the large filters at their worst.

4. On the Climate of Bengal .- By H. F. Blanford Esq.

Although Bengal is situated for the most part without the tropical zone, its climate is characteristically tropical. The mean temperature of the whole year varies between 80° in Orissa and 74° in Asám; that of Calcutta being 79°.

In the annual range of the temperature, as well as in point of humidity and rainfall, the eastern and western portions of the province are strongly contrasted. In Kachár, nearly 200 miles from the sea, the mean temperature of June is 82°, that of January 61.5°, and the highest and lowest temperatures recorded during 5 years, viz., 99° and 43° shew an absolute range of 56° only. At Chátgáon, on the sea coast, the recorded range does not exceed 49°. On the other hand, Patna has a mean temperature of 87.2° in June and 60.7° in January; and in 1869, the highest and lowest temperatures registered were 116.3° on the 12th May, and 36.9° on the 3rd and 4th of January; the absolute range of this single year was therefore 79.4°. It is probable that some parts of Bihár, the neighbourhood of Gya for instance, experience a range somewhat greater than that of Patna.

The highest temperature recorded in Calcutta during the last 18 years is 106°, which has been reached twice only; viz., in May 1867 and again in May of the present year. The lowest temperature 52.7° has been record-

ed also twice, viz., in January 1860 and 1864, and 52.8° has been observed twice, viz., in January 1857 and 1861. The extreme absolute range of the temperature of the Capital is therefore a little over 53°, and the mean temperatures of December and May are 68.5° and 85° respectively. The annual rise and fall of temperature exhibits some other local variations. Thus in Orissa and the Western part of the Gangetic Delta, December is the coldest month of the year; elsewhere the temperature reaches its minimum in January. This difference is due to the sea-winds setting in on this part of the coast very early in the year; whereas on the Arakan coast and in Bihár, their influence is not felt till much later in the season.

May is the hottest month of the year in all parts of the Lower Provinces with the exception of a part of Bihár, Asám and Kachár. In the former, the average temperature of June is a little above that of May; and in the latter districts, which enjoy a comparatively cool but humid atmosphere in April and May, the temperature rises slowly and uniformly up to July or August. In upper Asám it is higher than in the lower part of that province, from May to October; and higher also than in Kachár. The mean temperature of Síbságar in July and August is 84.7,° that of Goalparah 81.2°, and that of Silchár 82.°

During the rains, the temperature of the Hazáríbágh plateau, to the West of the Delta, falls more rapidly than that of any other part of Bengal. Between May and October, the fall at Hazáríbágh is rather more than 11° ; while at Barhampúr, under about the same latitude, it is only $4\frac{1}{3}^{\circ}$; at Calcutta little more than 3° , and even at Patna it does not exceed 8° . This peculiarity appears to be due principally to the cloudiness of the plateau in the daytime, whereby the sun's heat is rendered less intense; and to the greater radiation at night. This fact has an important bearing on the value of Hazáríbágh as a station for European troops, and as a sanitarium for invalids from the plains.

The high humidity of the atmosphere in Bengal, and more especially in its Eastern districts, has become proverbial; and if the term be used in reference to the quantity of vapour in the air, as measured by its tension, the popular belief is justified by observation. But if used in the more usual sense of Relative Humidity, that is, as referring to the percentage of vapour in the air, in proportion to that which would saturate it, the average annual humidity of a large part of Bengal is considerably lower than that of England. In illustration of this, I give a comparative table of the mean vapour tension and relative humidity of London and Calcutta in each month of the year, and the mean of the whole year; the data for the former place being taken from an Essay on the Climate of London by the late Professor Daniell; those for the latter from the results of the hourly observations registered at the Surveyor General's Office, Calcutta, and computed in the Meteorological Office

of Bengal. The former are deduced from 17 years, the latter from 14 years observations.

Mean vapour	tension	in	thousandths	of	`an	inch.	
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	Jan.	Feb.	Mar.	Ap.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	YEAR.
London,	·245	-264	· 28 0	315	·340	·490	·534	·530	· 46 8	-389	·310	·281	·376 inch.
Calcutta,	·487	·549	·695	·805	-889	917	·951	·950	· 95 0	·828	·60 5	•489	·762 "

Mean Relative Humidity. SATURATION 100.

	Jan.	Feb.	Mar.	Ap.	May	June	July	Aug.	Sop.	Oct.	Nov.	Dec.	YEAR.
		_		_					-				
London,	97	94	89	84	82	82	84	85	91	94	96	97	89
Calcutta,	71	68	67	69	73	81	85	86	85	78	73	72	76

The quantity of vapour in the air of Calcutta, relatively to the dry air, is then, on the average of the year, about twice as great as in that of London;* but the relative humidity of the former equals that of the latter only in the three first months of the rains, which are among the driest months of an European climate.

The absolute humidity of the atmosphere is greatest on the coast of Orissa and the Sunderban, and diminishes inland as the distance from the sea increases. In the cold weather and spring months, this decrease is rapid everywhere, except in Eastern Bengal. In Kachár, however, the quantity of moisture in the air is as great as on the coast of Chátgáon, and even exceeds it, excepting between the months of February and May. During the hot weather months, the proportion of vapour to dry air increases steadily and rapidly in all that part of Bengal in which the hot westerly winds are not a regular phenomenon of the season; that is to say, on the Gangetic delta, in Eastern Bengal, and on the maritime plain of Orissa; but on the high ground further west and in Bihár, as well as generally in the N. W. Provinces, its increase is slower up to May or June, and it then rises rapidly

[•] In Calcutta the vapour of water constitutes on an average about two and a half per cent. by volume of the atmosphere; in London only one and a quarter. Next to the temperature, this is perhaps the most important climatal difference of the two places in all that affects health.

almost to an equality with that of the maritime region. This is clearly traceable to the winds; since, in the former region, winds from the sea predominate throughout the hot season, mitigating its temperature indeed, but at the same time rendering the atmosphere damper; and producing, when the air is calm, that oppressive feeling of sultriness, which is so trying to persons accustomed to the drier atmosphere of Bihár and the North-West.

The relative humidity of air or its nearness to saturation depends on the temperature as well as on the absolute quantity of vapour it contains. If the latter be constant, the air, as is well known, is drier with a high temperature than a low one. Thus arises, in the cold weather months, the apparent anomaly that, although the absolute humidity of Upper India at that season is considerably less than that of Bengal, its relative humidity does not undergo a corresponding diminution, owing to its lower temperature. At Banáras for instance and even at Láhor, as appears from the Panjáb reports, the relative humidity of the air in January and February exceeds that of Dháká and Barhampúr. In this sense the driest period of the year falls later and later in the spring months as we proceed inland. At Sagar Island, January is the driest month; at Calcutta, February and March; at Patna, April; at Banáras, April and May; while at Láhor and all places in the Panjáb, May and June are the months of greatest siccity. The frequency of rain depends on relative rather than absolute humidity: the quantity of rain that falls, other things being equal, chiefly on the absolute humidity of the air.

Eastern Bengal, including Kachar and Silhet, and the Himalayan Tarai. are the districts of the heaviest rainfall. Their average annual fall almost every where amounts to 100 inches; and on the exposed hill flanks, and at their foot, even this large amount is greatly surpassed. Thus Silhet has an annual average of 141 inches. Darjiling 126 inches, the Rangbi Cinchona plantation 175 inches, Buxa Fort 280 inches, (the average of three years.) and Cherra Púnji the enormous amount of 527 inches; this last is the highest average rainfall hitherto recorded in the world. The rainfall is also higher on the plains of the coast than on those lying more inland. Sagar Point has an average of 87 inches and Calcutta 66, False Point 74 inches and Katak 52.5. The lowest rainfall in the provinces under the Bengal Government is that of the Southern portion of Bihar, including Monghyr, Gya and Patna, where the annual fall does not much exceed 40 inches; and in the case of the last mentioned station is only 37 inches. North of the Ganges, it increases gradually up to the Himálaya; and, on the south. up to the high ridge of forest-clad country which is drained by the Son. the Damúdar and their tributaries. In this tract, where the mensoon winds from the opposite coasts of India meet, the fall of the few stations that have hitherto furnished registers, ranges between 50 and 60 inches. In

Calcutta the highest rainfall on record is that of 1871, when it amounted to 93.31 inches; the lowest during the last forty-five years is that in 1837, when the registered fall was as low as 43.61 inches. In subsequent years the lowest falls were those of 1838 (53.? inches), 1853 (52.08 inches) and 1860 (52.61 inches); up to the present year 1873, which now, (in November.) exceeds that of 1837 by about one inch only. The Cherra Púnji register of 1861 records a fall of 805 inches, of which 366 inches fell in the month of July alone; but it is not clear that this register is deserving of complete reliance. Twelve inches of rain in one day is however, far from unusual at Cherra Púnji. On the 13th June, 1861, an equal quantity fell in Calcutta within 24 hours, and on the 11th May 1835 the same quantity fill within three hours.

By far the greater part of the rainfall of Bengal falls between the months of June and October. Showers occur also in the hot weather months, and in the months of February and March hail-storms are not infrequent. In the Eastern districts, rain occurs occasionally in the cold weather months, but is less common in the Delta and the country further Westward, excepting in the N. W. Provinces and the Panjáb. In the Eastern districts and in Asám, rain is more abundant in all the earlier months of the year, and in April it sets in heavily, and reaches its maximum about June or July. Further to the West, the rains usually set in in June, and July and August are the months of the heaviest fall.

Except at the hill stations and in the immediate neighbourhood of the hills, the average proportion of cloud-covered sky varies between one-third and one-half of the whole. At Darjiling, on an average, the proportion of clouded sky to sunny sky is as 2 to 1. In Lower Bengal generally it is about 1 to 2; being however, rather higher on the coast. December and January are on the whole the brightest months of the year; but November, February and March are almost equally serene. June, July and August are the months of greatest obscurity. In these former months, the proportion of cloud is on an average from 10 to 15 per cent., in the latter months from 65 to 85 per cent.

These observations refer to visible dense cloud, but the depth of the sky tint indicating the pressure or absence of diffused cloud in the upper regions of the atmosphere would appear to follow a different law. No systematic observation has been made on the colour of the sky, but as the results of my own casual observations I gather that the sky tint is, on an average, much paler in the cold weather, than during fine intervals of the rains, indicating a greater quantity of condensed moisture at great altitudes.

The wind system of Bengal is so often referred to as a familiar illustration of the monsoons, that it might seem almost superfluous to re-describe a subject treated of in every text book on Meteorology. But it appears

from recent investigations, that, however well known at sea, the character and origin of the monsoons on the land have been very generally misunderstood. The monsoons are not two undivided currents, flowing to and from Central Asia during about equal periods of the year; but appear rather to consist, at each period, of at least two principal currents, the one tending to or from Northern India, the other to or from the interior of China; and there are probably other minor currents originating or terminating at other centres. The Indian branch of the winter monsoon originates in the plains of the Panjáb, the Gangetic valley, and the uplands of Central India; also in upper Asam; and blows as a very gentle wind towards the two great bays that wash the East and West coasts of the Peninsula. During this season, a Southerly wind prevails steadily on the Himalaya at heights above 6000 or 8000 feet, descending lower on the Western than on the Central part of the range. This appears to be the upper return current of the winter monsoon, and corresponds to the anti-trade of the trade wind region. It descends on the plains of Upper India, where the atmosphere is characteristically calm at this season; and brings the winter rains. It is less frequently felt in Lower Bengal, where the wind is variable from North and North-West; but to the eastward in Kachar, southerly winds are very prevalent at the winter season. In Northern India the two branches of the northerly monsoon appear to diverge towards the opposite coasts, from a line characterized by a ridge of higher mean barometric pressure, which passes from the Panjáb through Banáras to Katak. This monsoon ceases on the coast line of Bengal in the month of February, when in the lower atmosphere, sea winds set in. At first these are restricted to the immediate neighbourhood of the coast; but as the season advances and the heat of the interior plains rises under the influence of the returning sun, they penetrate further and further inland, and are drawn from greater distances at sea. In the interior of India, the wind becomes more Westerly, and blows towards Lower Bengal and Chutiá Nágpúr, not as a steady current, but as day winds, which in April and May are highly heated by the parched and heated soil, and constitute the well known hot winds of those months. Where these two currents meet, the thunder-storms well known as North-Westers are generated. Like the thunder-storms of Europe and the dust-storms of the Panjab, they are due to convection currents; and in Bengal owe their prevailing movement from the West or North-West quarter to the strength of the land wind, which maintains its course in the upper atmosphere above the opposite sea-wind which is felt at the land surface. At this time the N. W. wind continues to blow unsteadily in the South of the Bay; but calms are not infrequent; and it is not till June that the Southerly winds of the bay become continuous with the South East Trades of the South Indian Ocean, and that the South West monsoon, properly so called, sets in in India. This blows from both coasts, and the two branches meet along a line which about coincides with the Southern margin of the Gangetic plain. Both tend towards the Panjab, the region of the greatest heat at this season; and becoming gradually drained of their vapour in their passage over the land, that which remains on their reaching the plains of that province, suffices only to afford a scanty rainfall, inadequate to mitigate the temperature, and only rendering the heat more oppressive by increasing the relative humidity and diminishing the evaporative power of the air.

As an element of climate, apart from its secondary effects on the winds and consequently on the humidity, rainfall, &c., the pressure of the atmosphere is, as far as is known at present, of subordinate importance. Bengal, as in most tropical countries, its variation, except during the passage of cyclones, is small; scarcely amounting to an inch on the extremes of the year. The average pressure of the air in Calcutta, 18 feet above sea level, is equal to that of a column of mercury at the freezing point, 29.793 inches in height or to 14.6 lbs. on the square inch. It is highest in December, when the mean pressure, similarly estimated, amounts to 30.041 ins.; and lowest in June and July when it falls to 29 551 ins. on the average of the month. The daily variation is greatest in April, when the barometer falls on an average '141 inch between 9 A. M. and 5 P. M.; and least in July, when the corresponding change does not exceed '090 inch, and the day and night barometric tides are nearly equal. The irregular variations being small as compared with those experienced in extra-tropical countries, and the regular variations so much more strongly marked, it follows that, as a weather-glass, the barometer is apt to mislead persons who are unacquainted with the laws of its local changes; since the rough generalizations, which serve to interpret its action in Europe, no longer hold good even approximately in India. In certain cases indeed, its action would seem to be anomalous. Thus it generally rises rapidly before one of those thunder-storms that are so common in the hot weather; and at Cherra Púnji, the extraordinary rainfall of which would lead most persons to anticipate a generally low pressure during the rainy season, after allowing for differences of elevation, the pressure is, on an average, considerably higher than in Western Bengal, the N. W. Provinces and the Panjáb at this time of the year. Moreover, it appears from information supplied by Major H. H. Godwin-Austen that at this place the barometer rises before heavy rain, and remains high as long as the rain continues. When interpreted with proper precautions, the barometer is, nevertheless, as trustworthy and valuable a monitor of impending weather in India as it is elsewhere.

The storms prevalent in Bengal are of two classes. First those of the hot weather already noticed, which are formed over the land, and are of the nature of convection currents, like the summer storms of Europe; and second,

those more extensive and destructive storms, that originate over the Bay of Bengal, and are most frequent at the changes of the monsoons. ter have received the distinctive name of Cyclones; and the name is perhaps as good as any other, since in them a vorticose motion of the wind is a strongly marked character, and one of great practical importance; but it is by no means a character peculiar to these storms, since it may frequently be observed in a slight degree in the ordinary North-Westers, and Tornados which are apparently merely a severe form of the North-Wester, and differ from a typical cyclone only in their originating over the land, in their inferior size and shorter duration. It may be indeed that the direction of their circulation is not so constant as in the greater storms, but existing evidence is insufficient to settle this point. The dust-storms of the Upper Provinces also, have been shewn by Dr. Baddeley to consist of one principal and numerous minor vortices, exactly like the larger storms of oceanic origin. The pressure of the wind in Tornados and even in ordinary North-Westers is sometimes comparable with that of cyclones, and, within a limited area, the former are not less destructive. There is an important difference in the character of the surface wind in these two forms of land storms. In the North-Wester the violent wind usually precedes the storm, blowing outwards, and being in fact a descending current brought down by the friction of the falling rain. The centripetal currents which feed the storm are not felt at the ground surface, though they may frequently be traced in the motions of the lower clouds. In the Tornado, on the other hand, as in the true cyclone, the violent surface winds are centripetal and vorticose.

The Cyclones felt in Bengal begin, in all cases, over the Bay; and the more violent and extensive storms, which alone reach the land, probably require many days to form before they move forward from their place of origin. Some of the most destructive that have passed over Bengal, have proceeded from the neighbourhood of the Andaman and Nicobar Islands. Their relative frequency in the different months of the year is shewn in the following table, which includes storms of all parts of the Bay, and those that have been felt on all parts of its coasts, Bengal included.

January,	2	May,	17	September,	3
February,	0	June,	4	October,	
March,	1	July,	2	November,	14
April.		Anonst.	_	December	8

Of these seventy-three storms, twenty-three have been felt in Bengal or on its coasts, and all between the months of April and November inclusive. Their course is usually North across the Gangetic Delta, North West from the Orissa coast. The motion of the wind is in an involute spiral, revolving in a direction opposite to that of the hands of a clock, as in all cyclonic storms in the Northern Hemisphere. The greatest pressure of the

wind in these storms has yet to be ascertained. The highest that has been registered in Calcutta, by an Osler's Anemometer, is 50 lbs. to the square foot; but this was in a storm of no remarkable violence, and one which did but little injury in Calcutta. The centre of the storm, at the time, was passing some 15 miles to the East of the city, and the barometer stood at 28.712. In the far more severe storms of the 2nd November, 1867 and the 5th October, 1864, the Anemometer was blown away, under a pressure of 36 lbs. to the square foot, so that no register of their maximum force was obtained. There is a prevalent impression that cyclonic storms have been more frequent of late years than formerly, but the belief does not appear to rest on any sound basis of fact. Since the destructive storm of October, 1864, the attention of the public has been attracted to the subject more steadily than in former years; and many a storm that would have escaped notice, or, if reported in a newspaper paragraph, would have been speedily forgotten, is now made the subject of general conversation for the time, and recorded with all procurable detail, in the annual Meteorological Reports. To this cause probably may be attributed the popular belief in the greater frequency of storms in recent years. 1869 and 1872 were both stormy years.

The reading of the following papers was postponed-

- 1. On a secondary sexual character in Squilla raphidea, Fabr. By J. Wood-Mason, Esq.
 - 2. Enumeration of Burmese Palms. By S. Kurz, Esq.,
- 3. Note on two Muhammadan Gold Coins. By the Hon'ble E. C. Bayley, C. S. I.
- 4. On the Ruins of Dimápúr, in the Nágá Hills. By Major H. H. Godwin-Austen.

LIBRARY.

The following additions have been made to the Library since the meeting held in August last.

Presentations.

** Names of Donors in Capitals.

Royal Society, Proceedings, Nos. 144-145.

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Exchange.

The Athenæum, July, 1873.

Nature, Nos. 197-204.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent thereon.

	an Height of le Barometer 32º Faht.		of the Ba ring the d		ry Bulb ometer.	Range of the True during the ture during the Max. Min.		
Date.	Mean H the Bar at 32º	Max.	Min.	Diff.	Mean D Therm	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	; o	. 0	0
1	29.576	29.666	29.523	0.143	81.8	86.0	80.0	6.0
2	.641	.686	.583	.103	82.5	89.5	79.0	10.5
3	.617	.672	.540	.132	83.6	89.5	78.6	10.9
4	.551	.607	.468	.139	84.5	92.0	80.5	11.5
5	.521	.565	.457	.108	82.3	85.5	80.0	5.5
6	.560	.647	.503	.114	81.2	84.2	79.5	4.7
7	.625	.689	.576	.113	81.3	83.5	80.0	3.5
8	.690	.743	.846	.097	82.7	86.8	79.5	7.3
3	.714	.755	.663	.092	83.3	86.3	82.0	4.3
10	.705	.779	.646	.133	80.9	83.2	77.4	5.8
11	.713	.774	.666	.108	80.2	83.9	76.6	7.3
12	.756	.798	.717	.081	79.5	83.4	77.0	6.4
13	.717	.763	.655	.108	80.2	83.9	77.2	6.7
14	.667	.728	.609	.119	82.1	88.0	78.6	9.4
15	.657	.709	.589	.120	83.3	89.5	79.0	10.5
16	.662	.719	.607	.112	84.2	90.8	80.8	10.0
17	.679	.720	.625	.095	84.9	89.5	82.0	7.5
18	.678	.729	.627	.102	83.3	90.0	79.5	10.5
19	.676	.735	.592	.143	84.0	90.5	79.0	11.5
20	.654	.724	.585	.139	83.9	90.7	80.0	10.7
21	.678	.737	.604	.133	86.5	92.3	82.5	9.8
22	.681	.734	.599	.135	86.0	91.5	83.0	8.5
23	.666	.725	.610	.115	83.8	88.3	81.4	6.9
24	.642	.695	.566	.129	85.3	90.0	81.5	8.5
25	.629	.689	.561	.128	86.1	92.3	82.2	10.1
26	.630	.710	.556	.154	85.5	. 90.0	82.5	7.5
27	.606	.655	.542	.113	85.7	91.8	81.5	10.3
28	.545	.604	.468	.136	83.2	89.0	80.0	9.0
29	.489	.533	.426	.107	82.7	88.5	79.5	9.0
30	.537	.600	.484	.116	83.0	87.6	80.2	7.4
81	.570	.618	.507	.111	84.3	90.5	81.0	9.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb.

Thermometer Means are derived, from the hourly observations, made at the
several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

	dependent thereon.—(Continuea.)									
Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	MeanWeight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity. complete saturation being unity.		
	0	0	0	0	Inches.	T. gr.	T. gr.			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 5 6 17 18 9 20 21 22 23 24 25 26 27 8 29 30 31	79.9 80.3 80.5 81.0 79.6 80.0 81.1 78.9 79.0 78.2 78.9 80.5 81.6 80.2 80.6 81.3 82.9 82.1 81.0 81.9 81.9 81.9 81.9 81.9 81.9 81.9 81.9	1.9 2.2 3 1 3.5 2.2 1.6 1.7 2.2 2.0 1.2 2.0 1.3 3.7 3.3 3.1 3.6 3.9 2.6 3.9 3.7 4.2 3.6 3.8 3.7 3.6 3.8 3.7 3.6 3.8 3.7 3.6 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8 3.8	78.6 78.8 78.3 78.5 78.6 78.6 77.5 78.2 77.3 78.0 78.0 78.0 77.9 79.3 78.0 79.4 79.0 79.0 79.0 79.0 79.0 79.0 79.2 79.1 79.9 80.0	3.7 3.7 5.0 3.7 2.9 4.6 3.7 2.2 2.1 5.3 5.8 5.8 5.8 6.8 6.8 6.8 6.8 6.8 6.8 6.8 6	0.958 .964 .949 .955 .958 .955 .952 .943 .925 .946 .919 .940 .940 .940 .940 .940 .940 .940 .94	10.32 .36 .18 .23 .30 .29 .25 .12 .60 9.98 10.21 9.94 .10.15 .11 .09 .04 .46 .09 .13 .57 .91 .47 .40 .37 .35 .49 .41 .39 .45 .72	1.08 .28 .85 2.12 .99 1.60 .33 .12 0.67 .72 .73 1.40 .84 2.20 .03 1.84 2.19 .44 1.56 2.19 .44 1.70 2.27 .60 .23 .39 1.50 .27 .10 .50 .50 .50 .50 .50 .50 .50 .50 .50 .5	0.91 .89 .85 .83 .89 .91 .86 .89 .90 .94 .93 .85 .82 .84 .85 .87 .83 .81 .82 .80 .82 .80 .82 .80 .80 .81 .82 .83 .84 .85 .87 .83 .84 .85 .87 .83 .84 .85 .87 .88 .89 .80 .80 .80 .80 .80 .80 .80 .80		

All the Hygriometrica elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	igi net Lhi	for e	of the Br ich hour the montl	during	r B nete	Range of the Tempers ture for each hour during the month.		
Hour.	Mean Heigi the Baromet 32° Fahi	Max.	Min.	Diff.	Mean Dry B Thermomete	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	٥	. 0	0	0
Mid-						;	!	
night.	29 654	29.767	29.514	0.253	81.4	85.0	77.6	7.4
1	.644	.746	.507	.239	81.2	85.0	77.3 77.2	7.7
2 3	.633 .622 ·	.735 .725	.502 .483	.233 .212	80.9 80.8	83.5 83.3	77.2	6.3 6.1
4	.615	.717	.472		80.7	83.5	77.2	6.3
5	.627	.751	.482	.269	80.6	83.0	77.0	6.0
5 6 7	.641	.766	498	.268	80.6	83.0	77.2	5.8
7	.657	.780	.513		81.0	83.5	77.5	6.0
8	.670	.782	.525	.257	82.3	85.0	77.8	7.2
9	.681	.788	.533	.255	83.5	87.0	77.4	9.6
10 11	.683	.798	.533	.265	84.8	89.0	78.0	11.0
11	.676	.798	.518	.280	85.8	90.5	79.4	11.1
Noon.	.661	.790	.508	.282	86.2	91.0	78.5	12.5
1	.639	.761	.476	.285	86.8	92.0	78.5	13.5
2 •	.613	.745	.455	.290	86.8	92.3	79.0	13.3
3	.594	.736	.432	.304	86.8	92.0 92.3	79.3 79.7	12.7 12.6
4 5	.580 .578	.721 .726	.426 .431	.295 .295	86.6 85.3	91.3	80.0	11.3
6	.588	.734	.438	.296	84.2	88.5	78.2	10.3
7	.607	744	.455	.289	83.3	86.6	78.0	8.6
8	.630	.748	.480	.268	82.9	86.0	78.6	7.4
9	.651	.760	.502	.258	82.4	85.8	76.6	9.2
10	.667	.767	.516	.251	82.0	85.7	76.8	8.9
11	.665	.774	.519	.255	81.7	85.0	77.8	7.2
				- Ok			.	

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the mouth.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

Hour.	Mean Wet Bulb mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	M. El	Mean Weight Vaj in a Cubic fc of s	Additional Weig Vapour required	Mean degree of Humidity, complete saturation being unity.
	0	o	0	0	Inches.	T.Tr.	T. gr.	
Mid- night. 2 3 4 5 6 7 8 9 10	79.8 79.7 79.6 79.5 79.5 79.5 79.8 80.4 80.6 81.2 81.3	1.6 1.5 1.3 1.3 1.2 1.1 1.1 1.2 1.9 2.9 3.6 4.5	78.7 78.6 78.7 78.6 78.7 78.7 78.7 79.0 79.1 78.6 78.7 78.1	2.7 2.6 2.2 2.0 1.9 1.9 2.0 3.2 4.9 6.1 7.7	0.961 .958 .961 .958 .961 .961 .961 .970 .973 .958 .961 .943	10.35 .32 .37 .34 .37 .37 .46 .47 .28 .29	0.92 .89 .73 .67 .64 .64 .68 1.11 .72 .77	0.92 .92 .93 .93 .94 .94 .94 .90 .86 .83
Nom. 1 2 8 4 5 6 7 8 9 10 11	81.6 81.9 82.1 82.1 81.7 81.5 81.1 80.8 80.7 80.4 80.2 80.0	4.6 4.9 4.7 4.7 4.9 3.8 3.1 2.5 2.2 2.0 1.8 1.7	78.4 79.0 79.3 79.3 78.8 78.9 79.0 79.2 79.0 78.9 78.8	7.8 7.8 7.5 7.5 7.5 6.6 6.3 4.3 3.7 3.4 8.1	.952 .970 .979 .979 .964 .964 .967 .970 .976 .976 .976 .967	.15 .33 .42 .42 .27 .29 .37 .42 .48 .44	.84 .88 .79 .79 .87 .35 1.87 .51 .31 .17 .06 0.99	.78 .79 .79 .79 .81 .85 .87 .89 .90

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations. taken at the Surveyor General's Office, Calcutta, in the month of August 1873.

Solar Radiation, Weather, &c.

	rge I.	WIND.			
,	Rain Guage 1½ ft. above Ground.	Prevailing direction.	Ma: Press	$\begin{bmatrix} \text{Daily} \\ \text{Velocity.} \end{bmatrix}$	General aspect of the Sky.
0	Inches			Miles	0 4 10 04 11
139.0	0.74	SSW,SE&SSE	1.2	77.4	O to 10 A. M. S to 11 P. M. Slight R at after intervals.
139.8	0.08	SE&ESE		178.9	Õ to 5 p. m., \io 9 a. m.
100.0	0.00				oi to 1 P.M., O to 5 P. M., i to
					9 P. M., B to 11 P. M. T between
					2 & 3 p. m. Light R at 12 4 A.m. 14, 24 & 33 p. m.
145.0	0.13	SSE&SE		97.0	
140.0	0.10	00100			Li to 7 A. M. ni to 5 P. M., \i
					to 11 P. M. Tat 41 & 5 1 P. M.
					L between 7 & 8 P. M. Slight R
141.0	0.08	SSE, SE&E by S	0.8	79 4	at 4½ A. M. 3 & 4 P. M.
141.0	0.07	SSE, SERE UY C	0.0	12.3	i to 11 P. M. Tat 41 P. M. Light
			İ		R at 31 & 41 P. M.
139.0	0.11	SE&E	0.6	154.8	S to 8 A. M., ai to 11 P. M.
,-			1		Light R afterintervals, after 9
	0.04	SE&S	1 0	. 990 5	O to 4 P. M. S to 8 P. M., Li
	0.34	2 17 97 12	1 1.0	1200.0	to 11 P. M. Slight R at afterin-
					tervals from 2 A. M. to 1 P. M.
	0.05	8 & S S E		170.0	\i to 5 A. M. O to 4 P. M., \i
					to 11 p. M. Light R at 51, 61,
8 129.0		SSE&SSW		122.0	10 & 11 a. m. S to 6 p. m., hi to 11 p. m.
6 120.0	•••	D D II OC D D 11		100.0	Dat 8 A. M.
9 125.5		S S W & S		191.1	O. Dat 1, 8, 11 1 A. M. & 6 P. M.
10	0.32	8 & S S W		177.2	O to 6 P. M. S. to 11 P. M. L.
					O to 6 P. M. S. to 11 P. M. L. from 8 to 10 P. M. Slight R from 6 to 12 A. M.
11	1.12	88W&8		107.1	O to 4 P. M. S to 7 P. M. O to
7.	1.14	30			11 P. M. Tat 11 A. M. & 8 P. M.
					Lat 8 P. M. R from 101 A. M.
-0	#1 01	C TAT & C C TET	0.6	01.9	to 4 & 8 to 11 P. M. O. Slight R from midnight
12	*1.61	SW&SSW	0.0	81.2	to 7, 11 A. M. to 2 & at 6 P. M.
					10 1, 10 2 00 00 0 21 24.

[`]i Cirri,—i Strati, ^i Cumuli, ∟i Cirro-strati, ~i Cumulo-strati, ~i Nimib, vi Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning. *Feel since 8 P. M., of the 11th R rain, D drizsle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1878.

Solar Radiation, Weather, &c.

Date. Max. Solar radiation.	Ban Guage F. Book Cound Discound Mai	General aspect of the Sky.
	Inches	83.2 O to 5 P. M. clouds of different kinds to 11 P. M. R from 3½ to 8 A. M. D from 9 A. M. to
14 140.0	0.70 W N W, S W& S	4 P. M. & at $10\frac{1}{2}$ P. M. 41.5 O to 5 A. M., \int to 8 A. M. O to 10 A. M. \cap to 7 P. M., \int to 11 P. M., Slight R at 10 A. M.
15 142.5	0·11 S by E & W S W	(5), 6), 8 & 11 P. M. O to 3 A. M., it to 1 r. M. it to 4 P. M. O to 11 P. M. L. at 11 P. M. Light R between mid 11 F. 1 at 11 21 7 % 10 n. m.
1	0.07 WSW&SW	& 1 at 1½, 2½ a. m., 7 & 10 p. m. Clouds of different kinds. L at midnight, 7 & 8 p. m. Slight. R at 5 ¼a. m., & 10 p. m.
17 149.0 18 142.0	W S W & S S W	O to 6 A. M., i to 4 P. M. O to 8 P. M. S to 11 P. M. Tat 6 P. M. Lat 7 P. M. O to 8 A. M., i to 7 P. M. S
19 144.0	0.93 S W & S by W	to 11 P. M. T between 4 & 5 P. M. L at 10 & 11 P. M. Light R at 1, 2, 3, 7 A. M. 4, 5, 6 & 8\frac{3}{4} P. M. i to 2 A. M., i to 9 A. M., i to 3 P. M. O to 11 P. M. L at midnight & 1 A. M., & from 7 to
20 146.0	0.37 SE&S '0.8	10 P. M. T & R from 6\frac{1}{2} to 11 P. M. S to 5 A. M., \si to 9 A. M., \si to 2 P. M. O to 7 P. M. B to 11 P. M. L at midnight. T & R be-
21 140.5,	S by W & S S E	tween 3 & 4 P. M. S to 6 A. M., ~i to 7 P. M. S to 11 P. M. L on S from 7 to 10 P. M.
22 145.2	S by E & S by W	. S to 1 a. m. B to 5 a. m., i to 7 p. m. B to 11 p. m.

i Cirri,—i Strati, ^i Cumuli, Li Cirro-strati, ^ i Cumulo-strati, ^ i Nimbi, i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning B. rain, D drizsle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the month of August 1873.

Solar Radiation, Weather, &c.,

٦	ar J.	. 4e	WIND			
Date.	Max. Solar radiation.	Kain Guage 1½ ft. above Ground.	Prevailing direction.	Max. Pressure	Daily Velocity.	General aspect of the Sky.
23	134.5	Inches 0.04	S by E & E S E		109.0	B to 2 A. M., \io 7 A. M., \io 1 to 7 A. M., \io 2 P. M. O to 4 P. M. S to 11 P. M. T at 2\frac{1}{4} P. M. Light R at
24	140.0		ESE&NE		70.0	12 ¹ ₂ A. M. 3 & 4 ¹ ₄ P. M. ` i to 6 A. M., ` i & ^ i to 12 A. M. S to 2 P. M., ` i to 6 P. M ^ i to 11 P.M. L from 7 to 11 P.M.
25	142.0	0.14	ESE&SW		104.4	o i to l a. m. B to 5 a. m., i to 8 a. m., o i to 7 p. m., i to
26	146.0	0.04	S W & E by S		86.3	to 7 P. M B to 11 P. M. Light R
27	141.5	! 	S E, E & S by E		117.4	at 1 ¹ / ₁ & 2 ¹ / ₂ P. M. B to 3 A. M., \i to 6 A. M. S to 9 A. M., \i to 8 P. M. B to 11 P. M. L on W at 7 ¹ / ₂ P. M. T & D
28	133.2	0.31	E by S & E	1.3	172.9	between 5 & 6 p. m.
2 9	132.0	0.70	E&SE	5.6	222.6	Chiefly O. Brisk wind from 2½ to 6 P. M. T between 11 & 12 A. M. L on W at 11 P. M. Slight
3 0	133.3	0.40	sw&ssw		240.2	Rafter intervals. () to 2 P. M., \(\circ\) to 9 P. M., B to 11 P.M., L from midnight to 4 A. M. Slight Rat 12, 32, 42,
31	143.0	0.48	S S W & S S E	1.2	107.6	9 A. M., 1 & 4½ P. M.
						34

i Cirri — i Strati. ^ i Cumuli. _ i Cirro-strati. ~ i Cumulo-strati ~ i Nimbi, i Cirro-Cumuli. B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of August 1873.

MONTHLY RESULTS.

			Inches.
Mean height of the Barometer for the month			29.637
Max. height of the Barometer occurred at 10 and 11 A.M. o	n the 1		
Min. height of the Barometer occurred at 4 P. M. on the			29.426
Extreme range of the Barometer during the month		•••	
Mean of the daily Max. Pressures			29.694
Ditto ditto Min. ditto	•••		29.574
Mean daily range of the Barometer during the month	•••	•••	0.120
satura wavey range of the Datometer during the monta	•••	•••	0.120
•			
16 - D D D D D D			0
Mean Dry Bulb Thermometer for the month	05.1	•••	83.3
Max. Temperature occurred at 2 & 4 P. M. on the 21st and		•••	92.3
Min. Temperature occurred at 9 r. M. on the 11th	•••	•••	76.6
Extreme range of the Temperature during the month	•••	•••	15.7
Mean of the daily Max. Temperature	•••	•••	88.3
Ditto ditto Min. ditto,	•••	•••	80.0
Mean daily range of the Temperature during the month	•••	•••	8.3
Mean Wet Bulb Thermometer for the month	•••		80.6
Mean Dry Bulb Thermometer above Mean Wet Bulb Ther	mome	er	2.7
Computed Mean Dew-point for the month			78.7
Mean Dry Bulb Thermometer above computed mean Dew	-point		4.6
	•	-	
		11	nches.
Mean Elastic force of Vapour for the month	•••		0.961
		Troy	grain.
Mean Weight of Vapour for the month		,	10.31
Additional Weight of Vapour required for complete satur	otion	•••	1.62
Mean degree of humidity for the month, complete saturation	haina	nn:/-	
Mean degree of numbers for the month, complete saturation	neing	шигсу	0.00
	•		•
Mean Max. Solar radiation Thermometer for the month			139.9
•			
•		T.	obes.
70 1 2 00 2 96 0 11 16 mile 3mile 04 1		11	
	•••	•••	1.27
Total amount of rain during the month		•••	10.23
Total amount of rain indicated by the Gauge" attached to	the and	mo-	0.04
meter during the month			9.84.
Prevailing direction of the Wind	D. D.	W &	5. K.

Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of August 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour. when any particular wind was blowing, it rained.

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Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the month of September 1873.

Latitude 22° 33′ 1″ North. Longitude 88° 20′ 34″ East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent thereon.

	an Height of te Barometer	Range of the Barometer during the day.		Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.			
Dute.	Mean H the Bar at 32°	Max.	Min.	Diff.	Mean D Therm	Max.	Min.	Diff:
-	Inches.	Inches.	Inches.	Inches.	0	, 0	0	0
1	29.564	29.613	29.507	0.106	83.9	89.3	81.0	83
2	.589			.113	83 0	89.0	80.0	9.0
3	.567	.629	.482	.147	810	89.5	79.5	10.0
4	.504	.550	.429	.121	83.4	88.0	80.0	8.0
5	.517	.580	.4 16	.134	82.7	89.0	80.0	9.0
6	.581	.652	.527	.125	78 6	60.5	76.5	4.0
7	.660	.711	.612	.099	82.0	86.8	780	8.8
8	.698	.740	.619	.091	85.0	90.0	80.5	9.5
9	.691	.7 41	.631	.110	86.0	' 90,0	82.2	7.8
10	.616	.696	.557	.139	85.0	91.0	80.5	10.5
11	.627	.681	.519	.135	84.6	91.2	82.0	9.2
12	-554	.627	.469	.158	82.1	86 5	80.0	6.5
13	-599	.666	.525	.141	81.7	87.8	79.0	8.8
14	.658	.703	.605	.098	81.3	86.2	79.5	6.7
15	.729	.795	.662	.133	83 5	89.5	79.3	10.2
16	.782	.850	.709	.141	84.9	90.5	80.0	10.5
17	.802	.872	.742	.130	84.0	87.6	82.0	5.6
18	.783	.856	.721	.135	84.6	89.5	80.3	9.2
19	.750	.808	.680	.128	84.8	89.8	81.0	8.8
20	.708	.769	.643	.126	85.0	91.0	81.5	9.5
21	.666	.716	.610	.106	86.1	90.8	82.4	8.4
22	.639	.690	.588	.102	86.6	92.0	82.0	10.0
23	.644	.689	.595	.094	86.8	92.5	82.5	10.0
24	.682	.732	.636	.096	87.0	93.0	82.5	10.5
25	.707	.762	.658	.104	83.7	87.5	81.5	6.0
26	.718	.772	.665	.107	85.8	92.0	81.0	11.0
27	.727	.792	.668	.124	86.6	92.8	82.2	10.6
28	.711	.755	.647	.108	86.5	92.5	82.5	10.0
29	.739	.816	.683	.133	86.6	93.6	81.5	12.1
30	.791.	.859	.736	.123	84.6	91.5	81.0	10.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the mouth of September 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued.)

Date.	Mean Wet Bulb Ther-	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour.	MeanWeight of Vapon m a Cubie foot of air.	Additional Weight of Varour required for complete saturation.	Mean degree of Hunn- dity, complete sam- ration being unity.
	. •	o	o	o	Inches	T. gr.	T. gr.	
12345678910122314567890112231456223122324256227289	81.1 80.6 81.1 81.3 80.7 77.7 79.6 81.0 81.7 81.9 80.1 79.6 81.4 81.3 81.5 81.8 81.1 81.9 81.4 81.4 80.7 80.9 81.1 80.7	22.91294033701741665535 22.22294033701741665535 22.122940337017416655 3.5535 4.559609064.554.664.6	79 6 78 9 79 1 79 8 79.0 77.9 78.2 78.4 80.0 78.4 79.6 78.8 79.6 78.8 79.0 78.8 77.0 78.6 77.0 78.6 77.0 78.7	4 3 1 1 9 3 6 7 1 1 5 3 6 7 1 5 3 6 8 7 1 6 8 7 1 5 3 4 4 1 6 1 0 6 1 1 1 6 1 1 1 6 1 1 1 6 1	0 989 .967 .973 .995 .970 .913 .937 .946 .961 .983 .989 .989 .989 .989 .989 .989 .970 .964 .970 .944 .970 .946 .970 .961 .970 .961 .970 .961 .970 .961 .970 .961 .970 .983	10 60 .39 .12 .66 .12 9.88 10.08 .11 .26 .49 .70 .35 .14 .25 .54 .58 .60 .23 .31 .37 .29 9.95 10.33 .01 .28 9.88 .00 .00 .00 .00 .00 .00 .00	1 53 .75 .30 .30 .0 50 1 39 2 12 .65 .04 1.69 .16 .23 0.99 1.46 .91 .57 2.16 .15 .16 .319 2.88 3.19 2.88 3.28 1.79 2.93 3.12 45 2.72	0.87 .86 .89 .89 .81 .80 .81 .80 .81 .80 .81 .80 .81 .80 .83 .83 .83 .83 .83 .76 .85 .77 .78 .78

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1878.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	Mean Height of the Barometer at 32. Faut.	for c	Range of the Barometer for each hour during the month			Range of the Tempera ture for each hour during the month.		
Hour •	Mean H the Bare	Max.	Min.	Diff.	Mean Prv Bulb Thermometer.	Ма ч .	Min.	Diff.
	Inches.	Inches	Inches.	Inches	o	o	o	o
Mid-	20.050	29 519	29 529	0 290	CD 1	4.5.0	50.0	0.0
night	29 679				82 1 82 0	85.0	79 0	60
1	.669	.807	.519 510	259 .257	817	$817 \\ 815$	78 6 78 2	61
2	.659	.797	.503	257	817	813	77.5	63
3	.630 .615	.790 .752	.199	.202	51.3	510	77.5	67 65
4 5	.655	.7~~	. 198	.290	812	83 7	77 5	62
8	.673	.800	.110	259	811	83 1	765	69
7	.657	.830	.515	312	816	810	77.2	63
8	.705	.337	.525	.3.3.3	83 3	85 7	77 5	82
8	.705	. 47:2	.550	.::22	85 I	87.7	780	97
	.720	864	.511	.323	86.5	89 3	780	115
]()]]	.707	.652	.529	.32.3	87.5	912	78.5	12.7
п	.101	.002	.020	.0	(,, o	012	70.0	
Noon	.689	.825	.513	.312	882	92 1	780	111
l	.662	.747	.189	.268	85.7	92 5	77.5]5 ()
2	.637	.771	. 160	.311	887	93 6	77 7	159
3	.618	.753	. 129	.324	87 6	93.0	78 L	146
4	.611	.718	. 110	.308	87.3	92 5	79 5	13.0
5 1	.611	.716	.4.39	.307	86 5	91.8	79.3	12.5
6	.625	.751	. 162	.292	85 2	89 ()	79 5	9.5
7	.617	.779	. 186	.293	813	87.8	80 2	7.6
8	.671	.799	.511	.288	83 7	86.6	80.2	6.4
9	.689	.821	.538	.286	83 3	86 5	80.0	6.5
10	.699	.835	.510	.295	82.4	86 0	80.0	60
11	.694	.839	.536	.303	82 6	85 5	79.0	6.5

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1878.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

	b Th		Po	Þ		Vapou of air.	eight o red foi ration.	ity
R our.		Dry Bulb abor	Computed Der	ry Bulb Point.	n El	Mean Weig in a Cubic	onal Weight or our required for lete saturation.	dity. complex settion being unity
	Меал	Dry	Com	Poi	Mean El	Mean in 8	14 78 78	M dity tion
					Inches.	T. gr.	T. gr.	
Mid- night	80 7	17	79 5	2.9	0.986	10.60	1.01	0.91
l	80.5	17 15	79.4	26	.983	.56	0.91	.92
	80 4	1.3	79.5	22	.986	.62	.75	.93
3	80.2	1.3 1.2	79.3	2 2 2.2	.979	.55	.76	.93
. 2 3 4 5 6 7 8 9	80.1	1.2	79.3	20	.979	.55	.69	.94
5	80.0	1.2	79 2	2.0	.976		.69	.94
6	79.9	1.2 1.4	79.1	2.0	.973	.49	.68	.94
7	80.2	1.4	79.2	2.1	.976	.52	.82	.93
8	80.5	28 4.1	78.5	4.8 7.0	.953	.25	1.68	.86
1 0	81.0 81.5	5 ()	78.1 78.5	8.0	.043 .955	.08 .18	2.19 .92	.80 .78
iï	81.6	5.9	78.1	9.4	.943	.04	3.45	.74
11	61.0	0.5	70.1	J. 1	.040	.04	0.40	./4
Noon.	81.8	64	78.0	10.2	.940	9 99	.77	.73
1	81.7	7.0	77.5	11.2	.925	.82	4.14	.70
2	81.9	6.8	77.8	10.9	.934	.91	.05	.71
3	81.4	6.2	77.7	9.9	.931	.90	3.62	.73
4	81.4	5.9	77.9 78.2	9.4 · 8.3	.937 .9 4 6	.98	.43	.74
5	81.3 81.1	5.2 4. l	78.2	7.0	.946	10.09 .11	.01 2.50	.77 .80
7	81.2	3.1	79.0	5.3	.970	.40	1.88	.85
8	80.9	2.8	78.9	4.8	.967	.37	.70	88
9	80.8	2.5	79.0	4.3	.970	.42	.51	.86 .87
10	80.6	2.2	79.1	3.7	.973	.45	.30	.89
ii	80.6	2.0	79.2	3.4	.976	.50	.18	.90
							-	

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the month of September 1873.

Solar Radiation, Weather, &c.

WIND.

_		. "	IND.		
Date Max. Sol	11 fr. abo Ground	Prevailing direction	Max.	Daily elocity.	General aspect of the Sky.
0 1	nches 0.09	SS E&E	S E 1.0	Miles 138.4	to 5 P. M. i to 11 P. M. L. on S W at Midnight, Slight R at
2 133.8	0.10	ESE&S	E ; 1.6	188 2	
3 143.0		ESE&S			Light Rafter intervals.
4 123.0	0.11	S Æ &	i	196.3	i to 11 P. M. Tat 1 & 3 P. M.
5 129.0	0.70	S&ES	Е 0.8		Slight R at 13 A. M. 13, 3, 5 & 7 P. M. 7 P. M. 1 to 7 A. M. 1 to 1 P. M. O to 5 P. M. \int to 9 P. M. O to 11 P. M. T between 2 & 3 P. M. R
6 7 134.0	2.32 0.19	S S W & Sb S by W & S	y W, 1.8 W,	182.7 178.0	from 2½ to 3½ at 5 & 11 p. m. O. R nearly the whole day. O to 9 a. m. 'i to 6 p. m. B to 11 p. m. T from 1 to 3 a. m. Slight R from Midnight to 3 at
8 139.0		SW&Wb	y S	133.8	7 3 & 9 A. M. i to 2 A. M. i to 6 A. M. B to 8 A. M. i to 3 P. M. i to 11
9 137.8		W by S& W 1	oy N		P. M. i to 12 A. M. i to 6 P. M. B to 8 A. M. i to 11 P. M. L
10, 136.5	0.2 9	W by N & E l	by S 1.0	106.2	P. M. O to 11 P. M. Tat 21 & 4
11 133.7	0.29	E by 8 & .	'n	109.9	P. M. Lon S between 8 & 9 P. M. Slight R at 2\frac{1}{2}, 4\frac{1}{2}, 6\frac{1}{2}, 9 & 10 P. M. O to 1 A. M. \i to 9 A. M. \infty i to 2 P. M. O to 5 P M. S to 8 P. M. \i to 11 P. M. T at 3 P. M. Lat 7.8 & 11 P. M. Rat 3 & 4 P. M.
`i Cirri,—i	Strati	, ^i Cumuli, \	_i Cirro-	strati, 🤈	~i Cumulo-strati, ~i Nimbi,

Vi Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning,

R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the mouth of September 1873.

Solar Radiation, Weather, &c.

olar.	nge ove 1.	Wini	ь.		
Date. Max. Solar	Rain Guage 13 ft. above Ground.	Prevailing direction.	Vr. Pes) a 50,	General aspect of the Sky.
12 131.0	Inches 0.72	E	1b 2.4	1	S to 2 a. m. \int to 6 a. m. () to 7 p. m. S to 11 p. m. I. from Midnight to 2 a. m. & at 8 p. m. R at 5 \(^1\), 11\(^1\) & & from 12\(^1\) a. m.
		SE, SE& SSE	2.0	238.0	0 2 p. m. Chiefly O. T between 2 & 3 p. m. R from Midnight to 3 at $t_{\frac{1}{2}}$, $\theta_{\frac{1}{2}}$, 11 a. m. & $2\frac{1}{2}$ p. m.
14 120.0	0.13	SE&S by E		A A	S to 1 a. m. i to 4 a. m. S o 7 a. m. i to 1 p. m. O to 8 c. m. i to 11 p. m. T at 11 l. m. Lon S W at 4 a. m. Light R at 8 1, 10 1, 12 a. m. & 5 p. m.
15 112.0	0.07 81	yE,SSE&SSW		149.8	\[\i \ta \text{A. m. } \cap \i \ta \ta \text{A. m. } \cap \i \ta \ta \text{T. p. m. } \\ \ta \text{B} \\ \ta \text{Light } \text{R at } \begin{array}{c} \begin{array}{c} \text{C}_1^1 \\ \text{P. m.} \end{array} \]
16 147.0	0.06	s s w		98.5 fo	B to 2 A. M. \i to 9 A. M. \i o 6 P. M. O to 11 P. M. Tat 9 o 10 P. M. L from 7 to 10 P. M.
17 139.5	s	W, & S by E		94.1 to	ight R at 5 9 & 11 p. m. O to 1 a. m. \i to 5 a. m. S O 8 a. m. \i to 11 a. m. O to 3 o m. \i to 7 p. m. B to 11 p. m.
18 140.2	SI	by E & S S W		98.4 to	Dat Midnight. B to 7 A. M. Oi to 5 P. M. Ni T. M. B to 11 P. M. Lon West Midnight 7 P. S. D.
19 143.5	; s	s w & s w		133.0	Wat Midnight 7 & 8 P. M. B to 5 A. M. \i to 10 A. M. i to 12 A. M. \i to 6 P. M. B
20 143.5		ssw		170.1 to at	B to 8 A. M. ~i to 3 P. M. ~i 7 P. M. B to 11 P. M. L on N 7 & 10 P. M. T& D at 22 M.
21 144.0	a	8 8 W & W		150.4 7	B to 7 a. m. \i to 10 a. m. i to 1 p. m. S to 5 p. m. \i to p. m. B to 11 p. m. L on N at 1 p. m.

4bstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the mouth of September 1873.

Solar Radiation, Weather, &c., .

	lar. n. age ove	WIND.		
	Max. Solar radiation. Kain Guage 1½ ft. above Ground	Prevailing direction.	4; & 'e 'c	General aspect of the Sky.
	o Inche	S:		
22	141.8	⁸ S W & W by N	95.7	B to 12 A. M. ~i to 5 P. M. B to 11 P. M.
6)*)	143.0	W by N & W	1199	B to 6 A. M. \i to 8 A. M. B
20	140.0	W Dy IV & VV	110.0	to 11 A. M. oi to 4 P. M. B to 11
1		İ		р. м. Tat 2 & 3 P. м. Dat
		1		3, P. M.
21	139.0	W, N W & S W	99.0	Bto 5 P. M. \i to 6 P. M. O
,	1001	11,21 11 00 5 11		to 11 P. M. Tat 4 P. M.
	131.0	S W & S S W	+120.8	S to 8 A. M. his to 1 P. M.
		1 5 6 2 2		S to 8 a. m. vie to 1 p. m. S to 5 p. m. i & i to 11 p. m.
				T at 31 & 41 P. M.
	141.5	SSW&SW:	139.9	Btola. M. wi to 10 A. M.
				i to l p. m. i to 4 p. m. B'
				to 11 P. M. Lon N E at 11 P. M.
	143.0	s w & w		B to I P. W. i to II P. M.
28	141.4	$\mathbf{s} \ \mathbf{w}$	135.3	B to 7 A. M. \i to 1 P. M. ci
				to 1 P. M. i to 6 P. M. B to 11
٠.			1040	P. M. Dat 21 P. M.
29	146.8	S W, E & S by E	104.8	B to 10 A. M. Ci to 8 P. M. Ci
		1		to 11 P. M. Lon N W between
	139.0	0 h 12 C 12 h 0	05.8	9½ & 10½ r. m. D at 6½ r. m. Clouds of different kinds T
	199.0 }	S by E & E by S	20.0	at 41 & 5 P. M. D at 34 P. M.
				me al ce a ve we D un of te w.

i Cirri — i Strati, i Cumuli, i Cirro-strati, i Cumulo-strati i Nimbi, i Cirro-Cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, R rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of September 1873.

MONTHLY RESULTS.

Contract of the Contract of th		
		Inches.
Mean height of the Barometer for the month		29.668
Max. height of the Barometer occurred at 9 A. M. on the 17th		
Min. height of the Barometer occurred at 3 P. M. on the 4th		. 29.872
		29.429
Extreme range of the Barometer during the month		().443
Mean of the daily Max. Pressures		29.726
Ditto ditto Min. ditto		29.605
Mean daily range of the Barometer during the month	•••	0.121
		0
Mean Dry Bulb Thermometer for the month		84.3
Max. Temperature occurred at 2 p. m. on the 29th		93.6
Min. Temperature occurred at 6 P. M. on the 6th		76.5
Extreme range of the Temperature during the month		17.1
Mean of the daily Max. Temperature		89.7
Ditto ditto Min. ditto,		80.7
Mean daily range of the Temperature during the month		9.0
mous daily take of the remperature daring the mouth		0.0
•		
70.0° 7007 .4.70 .11 .001		
Mean Wet Bulb Thermometer for the month		80.9
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer		3.4
Computed Mean Dew-point for the month	•••	78.5
Mean Dry Bulb Thermometer above computed mean Dew-point	•••	5.8
	7	nches.
Man West's force of Warrant for the month		
Mean Elastic force of Vapour for the month	10	0.955
	·oy	grain.
Mean Weight of Vapour for the month		10.23
A 3 3 3 4 1 4 3 7 7 7 1 4 4 6 3 7 1 2 2 2 2 3 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4		2.05
Mean degree of humidity for the month, complete saturation being un	ity	0.83
	•	
Mean Max. Solar radiation Thermometer for the month		107.0
Mean Max. Solar radiation Thermometer for the month		137.3
		
	-	
	11	nches.
Rained 21 days,-Max. fall of rain during 24 hours	•••	2.32
Total amount of rain during the mouth	•••	5.82
Total amount of rain indicated by the Gauge* attached to the aneme	0-	
meter during the month		5.44.
Prevailing direction of the Wind S. S. W	&	s. w.
•		·

Height 70 feet 10 inches shove, ground.

Abstract of the Results of the Hourly Meteorological Observations tell nat the SGO Celeutta in the month of Sept 1873 WONTHEN RE ULT

Tables shewing the number of days on which at a , wen hour any partium and blew together with the number of days on which at the same hour when an pritecular wind was blowing, it isined

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Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1873.

Latitude 22° 33′ 1" North. Longitude 88° 20′ 34" East.

Height of the Cistern of the Standard Barometer above the sea level, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements

dependent thereon.

	n Height of Barometer		Range of the Barometer during the day.			Range of the Ter ture during the ture during the Max. Min.		
Date.	Mean H the Ba at 32°	Max.	Min.	Diff.	Mean I Therm	Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.			١	
1	29,799	29.858	29.725	0.133	84.9	91.0	79.5	11.5
2	.788	.855	.724	.131	84.8	91.5	80.0	11.5
3	.777	.842	.701	.141	85.7	93.0	78.5	14.5
4	.773	.827	.713	.114	83.9	89.5	79.2	10.3
5	.788	.854	.739	.115	84.4	91.0	78.0	13.0
6	.832	.907	.782	.125	82.6	89.5	76.8	12.7
7	.843	.915	.778	.137	82.1	88.8	76.0	12.8
8	.814	.908	.792	.116	81.8	88.5	75.5	13.0
9	.877	.950	.825	.125	81.5	87.5	75.0	12.5
10	.891	.963	.827	.136	82.6	89.1	77.0	12.1
11	.882	.950	.818	.132	79.4	86.2	77.0	9.2
12	.784	.851	.703	.148	80.4	87.6	76.0	11.6
13	.771	.835	.712	.123	80.9	88.0	76.5	11.5
14	.839	.903	.799	104	81.2	88.3	75.8	12.5
15	.824	.888	.754	.134	82.3	89.0	76.5	12.5
16	.812	.880	.770	.110	82.9	90.0	76.8	13.2
17	.840	.907	.794	.113	82.6	90.5	76.5	14.0
18	.840	.905	.781	.124	83.5	90.4	77.0	13.4
19	.813	.864	.749	.115	83.7	90.5	79.5	11.0
20	.838	.904	.775	.129	84.3	91.5	79.0	12.5
21	.857	.915	.806	.109	84.6	90.8	80.7	10.1
22	.864	.931	.813	.118	83.8	89.5	79.4	10.1
23	.874	.941	.825	.116	81.8	87.8	77.6	10.2
24	.862	.932	.810	.122	81.9	88.6	76.5	12.1
25	.871	.919	.827	.092	82.0	88.5	76.8	11.7
26	.850	.919	.797	.122	80.4	86.3	74.0 75.2	$12.3 \\ 12.3$
27	.821	.881	.764	.117	80.6	87.5	75.2 71.2	12.5 13.8
28	.827	.884	.781	.103	77.5	85.0 87.3	70.5	16.8
29	.848	.902	.809	.093	77.8 78.3	88.2	70.0	18.2
30	.870	.961	.819	.142		87.8	69.3	18.5
81	.857	.923	.799	.124	.778	07.0	08.3	10.0

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived, from the hourly observations, made at the several hours during the day.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1873.

Daily Means, &c. of the Observations and of the Hygrometrical elements dependent thereon —(Continued.)

			- K					
Date	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of vapour	MeanWeight of Vapour in a Cubic ioot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity. complete saturation being unity.
	0	0	0	0	Inches	T. gr.	T. gr	
12 3 4 5 6 7 8 9 10 11 2 13 14 5 6 17 18 9 10 12 23 14 25 6 27 27 29 30 31	80 0 80 0 80 1 77 3 71 0 73 1 75 7 76 7 76 7 76 9 77 1 76 9 77 7 76 2 76 2 77 7 76 2 71 9 72 1 70 1 69.6 68.0	4867161789834432056657791524778.789.8	76 6 6 2 9 7 2 0 3 0 7 6 6 5 2 9 7 2 4 8 6 5 7 2 4 8 7 1 5 3 7 2 4 8 7 1 5 3 7 1 5 3 7 1 5 2 2 9 6 7 6 7 6 6 4 7 7 2 6 9 6 7 6 6 4 7 6 3 5 6 1 1	83 82 95 80 121 116 138 99 100 48 58 119 1112 97 121 117 101 97 121 128 131 148 167	0.899 .899 .847 .879 .783 .691 .695 .766 .790 .813 .819 .857 .821 .763 .783 .783 .783 .781 .781 .781 .781 .781 .781 .781 .781	9 61 .61 .17 12 8 37 7 30 .39 .08 8 23 .19 9 11 .15 .23 8 88 .74 .05 .20 .39 .96 .08 .52 .69 .36 .37 .79 .25 .08 .38 .38 .38 .38 .38 .39 .39 .39 .39 .39 .39 .39 .39 .39 .39	2 88 85 3 33 2.71 3 94 4 38 .12 3 08 .19 1.51 .87 2 33 7.81 4.48 .61 .11 .06 .68 .69 .98 .37 .51 .93 4.26	0 777 -771 -774 -684 -631 -614 -78 -781 -816 -813 -79 -70 -70 -70 -70 -70 -70 -70 -70 -70 -70

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstruct of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1875.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.

	eight of meter at	for e				Range of the Temper ture for each hour during the month.		
Hour	Mean Height of the Barometer a 32° Faht.	Max. Min. Diff. Section Max. Min. Diff. Section Max. Min. Diff. Section Max. Max. Min. Diff. Section Max. Max. Min. Diff. Section Max. M	Min.	Diff.				
	Inches.	Inches.	Inches.	Inches.	o	0	o	•
Mid- night. 1 2 3 4 5 6 7 8 9 10	29 81 ₀ .831 .823 .814 .815 .828 .845 .860 .881 .897 .896 .878	.905 .903 .892 .886 .893 .906 .927 .959 .963	.762 .759 .719 .739 .755 .761 .775 .806 .814	.143 .114 .143 .147 .138 .142 .152 .153 .149	78.5 78.0 77.6 77.2 76.8 76.5 77.1 79.6 82.7 84.9	82.0 81.8 81.7 81.5 81.2 81.0 82.0 84.7 86.6 89.5	73.0 72.7 72.5 72.5 72.0 71.5 70.7 69.3 69.3 73:4 77.0 79.2 82.0	9.0 9.3 9.3 9.7 10.0 10.5 11.7 12.7 11.3 9.6 10.3 8.0
Noon. 1 2 3 4 5 6 7 8 9 10 11	.855 .820 .801 .785 .779 .783 .794 .811 .831 .846 .851	.885 .855 .848 .844 .840 .853 .883 .898	.751 .723 .707 .701 .703 .713 .738 .760 .772 .783	.131 .132 .141 .143 .137 .140 .145 .138 .146	88.0 88.2 88.2 87.6 86.3 84.2 82.6 81.4 80.4 79.8	92.5 92.5 93.0 91.6 90.5 88 8 87.5 86.0 83.7 83.5	84.0 79.3 77.5 78.9 79.9 79.5 79.0 76.0 75.5 75.0 73.5	8.0 13.2 15.0 14.1 11.0 9.8 9.5 10.0 8.2 8.5 9.1

The Mean Height of the Barometer, as likewise the Dry and Wet Bulb Thermometer Means are derived from the observations made at the several hours during the month.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1873.

Hourly Means, &c. of the Observations and of the Hygrometrical elements dependent thereon.—(Continued).

		u	ерепасии	mercon	- Continu	cwj.		
Hour.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
•	o	o	0	o	Inches.	T. gr.	T. gr.	Ì
Mid- night. 2 3 4 5 6 7 8 9 10 11	75.6 75.3 75.1 74.8 74.6 74.3 74.0 74.4 75.0 76.3 76.4	3.3 3.2 2.9 2.8 2.6 2.5 2.7 4.6 6.9 8.6 10.5	73.3 73.1 73.1 72.8 72.8 72.5 72.5 71.8 71.0 70.3 70.1	5.6 5.4 4.9 4.8 4.4 4.3 4.6 7.8 11.7 14.6 16.8	0.809 .803 .803 .795 .795 .787 .781 .787 .771 .751 .734 .729	8.73 .70 .62 .64 .56 .48 .51 .05 7.84	1.74 .65 .49 .45 .31 .27 .27 .28 2.38 3.67 4.65 5.49	0.83 .84 .85 .86 .87 .87 .87 .86 .78 .69 .63
Noon. 1 2 3 4 5 6 7 8 9 10 11	76.4 76.1 76.5 76.2 76.0 76.3 76.6 76.7 76.2 75.8 75.8 75.3	11.4 11.9 11.7 12.0 11.6 10.0 7.6 5.9 5.2 4.6 4.3 3.8	69.6 69.0 69.5 69.0 69.3 71.3 72.6 72.6 72.6 72.6	18.2 19.0 18.7 19.2 18.6 17.0 12.9 10.0 8.8 7.8 7.3 6.5	.717 .704 .715 .704 .704 .711 .758 .790 .790 .790 .787 .790	.62 .46 .58 .47 .47 .56 8.11 .49 .50 .52 .51	.98 6.22 .18 .29 .05 5.46 4.13 3.19 2.77 .42 .24 1.99	.56 .55 .55 .54 .55 .58 .66 .73 .75 .78 .79
						•		

All the Hygrometrical elements are computed by the Greenwich Constants.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Culcutta, in the month of October 1873.

Solar Radiation, Weather, &c.

	i ar	ge .	WIND.	
Ä	Max. Solar radiation.	ain Gua ft. abo Ground	Prevailing direction.	At 150 General aspect of the Sky.
	o 140.0	Inches		Miles B to 7 A. M., ai to 6 P. M., i to 11 P. M.
	144.6	İ	E & S E	100.9 B to 7 A. M., 1 to 6 P. M. B
	145.0	2.05	S E & E 1.8	to 11 p. m. 101.5 \ \i to 1 a. m. B to 4 a. m., \ \i to 7 a. m., \ \i to 11 a. m., \ \i to
4	139.4	I	S W & N E	11 P. M. T. & Lat 8 & & 11 P. M. Rat 8 & 9 P. M. 112.6 S to 4 A. M., \int to 8 A. M. i to 1 P. M. S to 5 P. M. i to 8 P. M. B to 11 P. M. Tat midnight. Lat midnight & il A. M.
	138.5		ENE&N by W	112.4 B to 11 A. M., i to 5 P. M. B
	135.6		N N E & W N W	to 11 P. M. 134.8 B to 5 A. M., i to 11 A. M. B to 5 P. M., i to 9 P. M. B to 11
7	137.0	1	w n w	189.2 B to 6 A. M., \i to 2 P. M. B to 11 P. M. Slightly Foggy from
0	100.0		NI has NAT OF TAX NI NAT!	1 to 4. A. M. 84.5 B.
	133.8 139.0	***	N by W & WNW N W & E by S	35.5 Lito 4 a.m., B to 6 a.m., \i to
8	100.0		11 11 00 12 03 0 1	5 г. н. В to 8 г. м., \i to 11 в. м.
10	137.8		E, E by S & S 0.8	101.5 \in to 6 a. m., \i to 12 a. m.,
		0.00	0 4 0 1 73 4 4	~i to 4 p. m. S to 11 p. m.
11	134.0	0.20	S & S by E 4.0	113.5 O to 7 A. M. S to 6 P. M. O to 11 P.M. Strong wind at 123 A. M.
				Slight R at 5 a. m. 1, 8 & 9
			•	P. M.
12	144.5	0.07	ESE, Eby N&E	126.9 O to 3 a. m., \i to 7 a. m., \i
				to 6 P. M. B to 11 P. M. Slight R at 5 d P. M.
19	138.0	0.08	ENE 0.7	
				to 6 P. M. B to 11 P. M. L at 61
				P. M. Slight R at 8 A. M. 1 &
				2 P. M.

[\]i Cirri,—i Strati, ^i Cumuli, ∟i Cirro-strati, ^i Cumulo-strati, \i Nimbi,, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lightning, E rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calculta, in the month of October 1873.

Solar Radiation, Weather, &c.

•	Solar tion.	ove ove	Wind.		
Date.	Max. Solar	Rain Guage 1½ ft. ahove Ground.	Prevailing direction.	Pressure Daily Velocity.	General aspect of the Sky.
1	o 1 139.0	inches	ENE	218.5	B to 3 a. m., \i to 6 a. m., \i to 4 p. m., \i to 6 p. m. B to 11
16	136.8	1	E N E & E by N;	137.8	P. M. B to 5 A. M \i to 12 A. M. \ci to 5 P. M. B to 11 P. M.
16	135.0		E by N	88.8	B to 10 A. M., ai to 5 P. M. B to 11 P. M.
17	138.0		Е by N & E N E	97.4	B to 10 A. M., \i to 6 P. M. B to 11 P. M.
-	141.5	'! !	ENE	91.7	B to 11 A. M., Li to 3 P. M. B
19	140.7	ί,	ENE, E&SSE	85.7	B to 1 a. m. S to 5 a. m., hi o 7 a. m. B to 10 a. m., hi to 6
				P	. м. В to 11 р. м.
	137.0 145.0		S E & H E & S E	92.8 65.5	B. B to 2 a. m., \ionito 5 p. m. B
22	138.0		SSE&S by E		D 11 P. M. D at 43 A. M. B to 4 A.M., clouds of different
			•	k	inds to 6 p. m. B to 11 p. m. B to 3 a. m., \io i to 3 p. m., \i
23	132 8		S by E		6 p. m. B to 11 p. m.
24	141.0	s	byE,ESE&EbyS	48.1	
25	138.8		E by S & E	19.0	B to 1 A. M., \i to 7 P. M. B
26 !	142.0		${f E}$	71.0	B to 4 A. M., hi to 8 P. M. B
27	139.0		E&NNE	15.7	B to 5 A. M., \i to 11 P. M.
28	136.8	' N	INE,NE&Eby N	to	B to 4 A. M., \ito 7 P. M. B
	129.0 135.8	'E	by N & E N E E N E & N '0.5	91.0 to	B to 5 a. m., \i to 11 P. m. B to 3 a. m., \i to 8 P. m. B
	140.0		N & N by W 0.8		i to 3 a. m. B to 12 a. m., i 7 p. m. S to 11 p. m.

[\]i Cirri,—i Strati, ^i Cumuli, \i Cirro-strati, \i Cumulo-strati, \i i Nimbi, \i Cirro-cumuli, B clear, S stratoni, O overcast, T thunder, L lighting R. rain, D drizzle.

Abstract of the Results of the Hourly Meteorological Observations taken at the Surveyor General's Office, Calcutta, in the month of October 1873.

MONTHLY RESULTS.

	Inches.
Mean height of the Barometer for the month	29.834
Max. height of the Barometer occurred at 9 A. M. on the 10th	29.963
Min. height of the Barometer occurred at 4 P. M. on the 3rd	
	29.701
Extreme range of the Barometer during the month	0.262
Mean of the daily Max. Pressures	29.899
Ditto ditto Min. ditto	29.778
Mean daily range of the Barometer during the month	0.121
	
	0
Mean Dry Bulb Thermometer for the mouth	ρο Λ
Max. Temperature occurred at 3 P. M. on the 3rd	00.0
Min. Temperature occurred at 6 & 7 A. M. on the 31st	69.3
Extreme range of the Temperature during the month	23.7
Mean of the daily Max. Temperature	89.0
Ditto ditto Min. ditto,	76.4
Mean daily range of the Temperature during the month	12.6
, <i>J</i> · <i>J</i> ·	
36 377.4 To 11. (f)	** 0
Mean Wet Bulb Thermometer for the month	75.6
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermome	ter 6.4
Computed Mean Dew-point for the month	71.1
Mean Dry Bulb Thermometer above computed mean Dew-point	10.9
	Inches.
Mean Elastic force of Vapour for the month	0.753
	
	Troy grain.
Mean Weight of Vapour for the month	0.10
Mean Weight of Vapour for the month Additional Weight of Vapour required for complete saturation	0.0=
Mean degree of humidity for the month, complete saturation being	unity 0.71
<u>.</u>	o
Mean Max. Solar radiation Thermometer for the month	138.5

domestic to the second	
	Inches.
m +	
Rained 6 days, -Max. fall of rain during 24 hours	2.05
Total amount of rain during the month	2.40
Total amount of rain indicated by the Gauge* attached to the an	emo-
meter during the month	2.17
Prevailing direction of the Wind E. &	E. N. E.
Section 2 and a section 2 and 2	

[•] Height 70 feet 10 inches above ground.

Abstract of the Results of the Hourly Meteorological Observations taken at the S. G. O. Calcutta, in the month of October 1873. MONTHLY RESULTS.

Tables shewing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

VOL. XLII.

PART I. (HISTORY, LITERATURE, &c.)

(Nos. I to IV.—1873: with ten plates.)

EDITED BY

THE HONORARY SECRETARIES.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of Asia, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely coase."

SIR WM. JONES.

CALCUTTA:

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1873.

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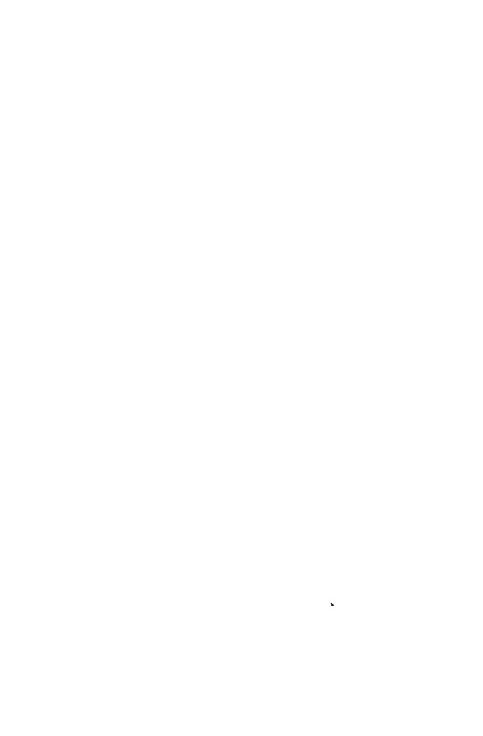
ERRATA

IN

JOURNAL, ASIATIC SOCIETY OF BENGAL, FOR 1873,

PART I.

Page 61, line 36, for सन read सने।.
64, line 30, for चंपका read चंपका.
71, line 17, for जाया read जाये।.
—— 74, line 33, for एघनस read एघनस्.
—— 81, line 6, for wa read way.
81, line 33, for कक्कमम् read क्रक्रमम्.
85, line 22, for Skr. Pr. and गेखामी read Skr. गेखामी and Pr. गेखामी
—— 80, line 37, —— 86, line 9, —— 100, line 6, —— 103, line 1,
86, line 9, for fafty read afty.
100, line 6,
95 line 16)
—— 85, line 16, —— 101, line 7, } for दिखनः read द्धः.
222, line 10, for river read G'hágrá river.
235, line 1, for to read and to.
, line 25, for downfall read downfal.
236, line second note, for Koch read of Koch.



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Part I.-HISTORY, LITERATURE, &c.

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Spirituous Drinks in Ancient India.—By BABU RA'JENDRALA'LA MITRA.

Sages and moralists have, in all ages and in every clime, expatiated in strong terms on the impropriety of indulgence in spirituous drinks, and some physiologists have recently discovered that such drinks do not possess any of the virtues which tradition has all along ascribed to them. We are told that they do not add to our strength, or power of digestion; they have no influence on the heart's action; they are powerless to increase the temperature of the body; they cannot help us to resist the chilling effect of cold; and are inert as aliments, failing alike in affording fuel for the lungs and material for the formation of the tissues. But neither the anathema of sages and moralists, nor the dicta of the professors of science, have anywhere sufficed to suppress their use. They prevail in some form or other in almost every part of the world; and those primitive races which have no knowledge of them, seize them with the greatest avidity the moment they find them; for, like tobacco, spirituous drinks have a peculiar charm which enables them, if not to defy, at least to hold their own alike against the deductions of science and the mandates of religion. In the eye of reason, voluntary inebriation may appear in the most offensive light; but there seems to be a craving in human nature to elevate the spirit above the dull routine of every-day existence, and to produce a temporary frenzy during which the cares and troubles of life are forgotten, and trains of delightful ideas fill the mind, which nothing can completely eradicate.

The history of Muhammadan civilization affords a most striking illustration of the truth of this assertion. None condemned the use of wine

more emphatically than the Prophet of Arabia, and yet there is no Muhammadan country where the consumption of wine is other than considerable, or as the great historian, Gibbon, has aptly expressed it, "the wines of Shiraz have always prevailed over the laws of Muhammad."

The annals of the Indo-Aryans yield a no less remarkable illustration. The earliest Brahman settlers were a spirit-drinking race, and indulged largely both in Soma beer and strong spirits. To their gods the most acceptable and grateful offering was Soma beer, and wine or spirit (for in connexion with India the two words may be used synonymously, there never having been any such thing as pure wine,) was publicly sold in shops for the use of the community. In the Rig Voda Sanhitá a hymn occurs which shows that wine was kept in leather bottles,* and freely sold to all comers. The said wine was, likewise, offered to the gods, and the Sautrámani and the Vájapaya rites, of which libations of strong arrack formed a prominent feature, were held in the highest esteem. Doubts have been entertained as to the nature of the Soma beverage, and people are not wanting who repudiate its intoxicating nature; but none will venture to deny that the surd of the Sautrámani and the Vájapaya was other than arrack manufactured from rice-meal, and that will suffice to show that the Vedic Hindus did countenance the use of spirit. As to the Soma, if any reliance is to be placed in the directions given for its preparation, and on the Vedic descriptions of its effect on the gods, it is impossible to take it to have been other than a fermented intoxicating beverage. Of this, however, I shall treat lower down.

In the hot plains of India, over-indulgence in spirituous drinks, however gradually bore its evil consequences, and among the thoughtful a revulsion of feeling was the result. The later Vedas accordingly proposed a compromise, and, leaving the rites intact, prohibited the use of spirit for the gratification of the senses, in language very similar to Sydney Smith's "Think not, touch not, and taste not," saying "Wine is unfit to be drunk, unfit to be given, and unfit to be accepted,"† and denounced drinking to be heinous in the last degree, quite as bad as the murder of a Brahman. The Smritis, following in their wake, included the sin of winebibing among the five capital crimes or mahápútakas, and ordained the severest punishment against the offender.

It is said that the prohibition was first promulgated by S'ukráchárya, the high priest of the Asuras, who was disgusted by the remembrance of certain excesses to which he himself had been led by over-indulgence in strong drink. The Mahábhárata has cuphuised the story in the 76th chapter

^{* &}quot;I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits." Wilson's Rig Veda, II, p. 204.

[†] मचनपेयमदेयमयाच । मृतिः।

of its first book. According to it, Kacha, son of Vrihaspati, had become a pupil of S'ukráchárya with a view to obtain from him the charm of reviving dead men, which none else knew. The Asuras came to know of this. and, dreading lest the pupil should obtain and afterwards impart the great secret to the Devas, assassinated him, and mixed his ashes with the wine of his tutor, and thus transferred him to the bowels of S'ukráchárya. It happened. however, that during his pupilage Kacha had won the affection of Devayani, the youthful and charming daughter of S'ukráchárya, and that lady insisted upon her father to restore the youth to her, threatening to commit suicide if the request was not complied with. S'ukra, unable to decline the favour to his daughter, repeated the charm, and anon, to his surprise, found the youth speaking from his own belly. The difficulty now was to bring the youth out, for this could not be accomplished without ripping open the abdomen of the tutor. S'ukracharya thereupon taught the youth the great charm, and then allowed himself to be ripped open, and Kacha, in grateful acknowledgement of his restoration to life, revived his tutor. Now S'ukrachárya, seeing that it was the influence of drink which had made him insensibly swallow the ashes of a Bráhman, and that Brahman his own pupil, prohibited the use of wine by Brahmans, "From this day forward," said he, "the Brahman, who through infatuation will drink arrack (surá) shall lose all his religious merit; that wretch will be guilty of the sin of killing Brahmans, and be condemned in this as well as in a future world. Let all pious Brahmans, mindful of their duty to their tutors, as also to the Devas and mankind in general, attend to this rule of conduct for Bráhmans ordained by me for all the regions of the universe."*

S'ukrachárya was followed by Krishna, who also cursed the winc-bibber because his kith and kin, the Yádavas, proved the most intractable and unruly of drunkards.

The legends on which these prohibitions are founded may be, for ought we know, after-thoughts, designed to illustrate the heinousness of excessive indulgence, and to give weight to the prohibitions, by invoking the authority of great men against over-indulgence. But the fact remains unquestioned that, from an early period, the Hindus have denounced in their sacred writings the use of wine as sinful, and two of their greatest lawgivers, Manut

श्वे त्राचाणेऽसप्रश्वतीच कचिकोचारहरां पास्ति नन्दन्तिः । चपेत भक्तां त्रच्यचा चेत स स्माद्क्षित् लोकं गर्चतः स्मात्यरे च ॥ सया चतां विप्रभक्तां छितेतां सर्यादां ने स्मापतां सर्वेशके । सक्तो विप्रा समुत्रांचा नुक्तां देवा लोकाचापस्रस्त सर्वे ॥ चादिपर्वेषि ०१ च॰ !

and Yajnavalkya* held that the only expiation meet for a Brahman who has polluted himself by drinking spirit, is suicide by a draught of spirit or water, or cow's urine, or milk in a boiling state, taken in a burning hot metal pot. Angira, Vas'istha and Paithinasi restricted the drink to boiling spirits alone. † Devala went a step further, and prescribed a draught of melted silver, copper or lead as the most appropriate. The Even in cases of accidental drinking of spirits through ignorance on the part of any of the three twice-born classes, nothing short of a repetition of the initial sacramentary rites, effecting a complete regeneration, is held sufficient to purge the sin.§ The Brahman woman who transgresses this law, is denied access to the region of her husband, and is doomed to be born a slut, or a cow, or a vulture. Manu likewise provides for judicial cognisance of such offence by Brahmans, and ordains excommunication and branding on the forehead the figure of a bottle as the most appropriate punishment. "237. For violating the paternal bed, let the mark of a female part be impressed on the forehead with hot iron; for drinking spirits, a vintner's flag; for stealing sacred gold, a dog's foot; for murdering a priest, the figure of a headless corpse.

"238. With none to eat with them, with none to sacrifice with them, with none to read with them, with none to be allied by marriage to them, abject and excluded from all social duties, let them wander over the earth.

"239. Branded with indelible marks, they shall be deserted by their paternal and maternal relations, treated by none with affection, received by none with respect: such is the ordinance of Manu." (IX.)

Even drinking of water kept in a wine bottle is held sinful, and various expiations are recommended for removing the sin.**

* सुराम्बृष्टतग्रेसूत्रपयसामग्रिसन्निमं। सुरापान्यतमं पीला सरकाष्ट्रविसम्बन्ति॥ याज्ञवस्कीये १ ष०।

† सुरापयार्द्रवाससा चाग्निवर्षां सुरां पिवेत्। ‡ सुरापाने त्राचाणा कव्यतावसीसकानामन्यमतग्रिकस्पं पीला सरीरत्यामासूयते।

§ अज्ञानानु छरां पीला रेता विष्णूत्रसेव वा। पुत्रः संस्कारसर्वेनित वया वर्णा दिज्ञातयः॥ ∥ पतिकोकं व सा याति त्रास्त्रकी या सुरां पिवेत्। द्वैव सा द्वानी स्टभी स्ट्रकरी चोपनायते॥

¶ The words are ব্যায়ের মুখ্যান । "For drinking, a liquor-flag," but as there is no flag known as peculiar to arrack, or arrack sellers, commentators take the term surádhvaja to mean the particular kind of jar or flagon which was formerly used to hold liquor. What the shape of this jar was, I cannot ascertain

** सद्यभाष्ट्रस्तितं तोयं यदि कचित् पिनेक् दिकः । पद्मोदुम्बर्गिक्वानां पद्माग्रस्य कुश्यक् च ॥ स्तेवामुद्दं पीता विराजेव विद्याश्वति । Other authorities on law and religion are in no respect less stringent. And yet it would seem that at no time in their history have the Hindus as a nation altogether abstained from the use of spirituous drinks as a means of sensual gratification. Elders, anchorites, sages and learned men, forming the bulk of the priestly race, doubtless scrupulously abstained from them, as they do now in this and other countries; and a good number of pious and respectable householders, and men of rank and position of the other classes followed their example, even as they do now; but as they constituted but a fraction of the sum total of the community, their abstinence could not lead to abstinence on the part of the whole nation, or the bulk of it. There was probably also a considerable amount of hypocrisy, or outward expression of horror against wine on the part of the higher orders of the people, such as we know does prevail in the present day; but Sanskrit literature, both ancient and modern, leaves no room for doubt as to wine having been very extensively used in this country at all times, and by all classes.

Manu, notwithstanding his stern anathema, found the public feeling or practice so strong against him as to be under the necessity of observing in one place that "there is no turpitude in drinking wine," but "a virtuous abstinence from it produces a signal compensation."* Elsewhere he provides that the soldier and the merchant should not deal in spirituous liquors, leaving the S'údras to follow the trade at their pleasure.† The prohibition in the case of the soldier and the merchant refers to arrack only, so they were at liberty to take all other kinds of liquor, and accordingly the Mitákshará comes to the conclusion that Bráhmans alone have to abstain from all kinds of spirituous drinks, the Kshatríya and Vaishya from arrack or paishti, leaving the S'údras to indulge in whatever they liked.‡

Coming from the age of the Vedas to that of the Sútras, I find that not only the soma and the surá of the Saühitás and the Bráhmanas retained their firm hold on the people, but several new candidates for public favour appeared in the forms of Mádhvíka or mowá, Gaudí or rum, tála or toddy wine, and so on. They could not have been manufactured had there been no demand for them, and the conclusion becomes irresistible, that they were used to a considerable extent as a means of sensual gratification, though they seem never to have found a footing in religious ceremonies.

न मांसभच्छे देखे। न सदो न च मैंगुने।
 प्रहित्या भूतानां निहित्तसु मदापाछा॥
 † X,89.

‡ वैवर्षिकानामुलप्तिप्रश्वति पेढीप्रतिषेषः । त्राचावस्य तु सद्यमावप्रतिवेषेशंध्युत्पत्तिप्रश्चत्येव । राजन्यवैद्यपिकु न कदाचिद्यि निवृत्राद्सियनिवेषः । ग्राहका तु न हराप्रतिवेषे नापि सद्यप्रतिवेषः । इति सिताचरा ।

Turning now to the Mahabharata we have abundant evidence to show that most the leading characters in that great epic were addicted to strong drinks, and no picnic or pleasure party was complete in which wine did not hold a prominent part. The extract from the Harivañs'a published in the last volume of this Journal (p. 340 et seq.) affords a very graphic account of the manner in which such distinguished personages as Baladeva and Krishna and Arjuna indulged in drink in the company of their wives, sisters and daughters, and other extracts equally precise and full, might be easily multiplied, if needed. The description of Arjuna's picnic on the Raivata mountain given in the Adiparva, offers a remarkable instance in point. Elsewhere Krishna and Arjuna are described as "having wine-inflamed eyes." "Both Krishna and Arjuna have been seen by me, both lying on a cot, or in their cars. besprinkled with sandal paste, and having their eyes reddened by madhvi and ásava." Sudeshná, the queen of Maharájá Viráta, in the Viráta Parva, feeling thirsty, sends her maid, Draupadi, to her brother, Kichaka, to obtain from him a flagon of good wine for her use. † In the Mausala Parva, the Yádavas are described to have been so overcome by drink at the sea-side watering-place of Prabhása as to have destroyed each other in sheer drunkenness.

According to the Bhagavata Purána, when questioned by his brother Judhisthira as to how the Yádavas were doing, Arjuna is reported to have said—"O king, our friends, of whom you are inquiring, losing, through a Bráhman's curse on the house of our well-wishers, their senses by over-indulgence in Váruni liquor, have, without recognising each other, exchanged blows and destroyed themselves. Now only four or five are left alive to tell the tale." ‡

The Rámáyana also frequently notices wine and drinking. In one place no less a personage than the great sage, Visvámitra, who is the author of a considerable number of the hymns of the Rig Veda, is said to have been entertained with maireya and surá by his host, Vasishtha. § Bharadvája

अभी मध्यासवधीनी अभी चन्दनविद्या । अभी पर्याङ्करियनी हटी से केशवार्जुनी ॥ † पर्वकि लं समृद्यि सुरामग्रं चकारय । तर्वनां प्रेवियधानि सुरावारी तवानिकं ॥ अतिष्ठ गन्ध सेरिन्जि कीचकसा निवेशनं । पानसानय कस्ताकि पिपासा मां प्रवादते ॥

‡ राजंखवानुष्टानां उच्चरां नः उच्चरारे । विश्रवापिननृष्टानां निम्नतां नुष्टिभिर्मियः ॥ वादकीं महिरां पीना महोन्मियतचेत्रमां । ख्यानतामिनाव्यान्यं चतुःप्यावयेविताः ॥

त्रीमङ्गानवते १ सन्त्र १५ सध्यायः ।

[§] Rámáyana, Carey's edition, I, p. 462.

another great sage, offered wine to Bharata and his soldiers when they spent *a night under his hospitable roof. "O ye drinkers of spirits," sat the sage, "drink spirituous liquors; O ye hungry, eat; fill yourselves with frumenty and various kinds of juicy meats.*" This sage welcomed Ráma by slaughtering "the fatted calf," but he is not reported to have offered the exile any liquor for his regalement. Two passages, however, occur in the second book of the Rámáyana which afford the most conclusive proof of wine having been extensively used, and held in considerable estimation as a favourite drink in former days. The practice of making vows at times of danger and misfortune to offer something choice to the gods, was universal in former days, and is common enough now in most parts of the world. The nature of the offering doubtless differs under different circumstances; but the offering is made all the same. The candles for the Madonna of Roman Catholic countries is in Bengal represented by milk, or frumenty, or richer offerings, and rarely is a child sick in the house, or a cow suffering from the pains of parturition, for which some milk is not vowed to the lares and penates. Sitá, the model of feminine grace and virtue, was not above this custom, and when crossing the Ganges in her way to the wilderness of the south, is said to have made a similar vow; but instead of mentioning milk or frumenty, she pledged herself to offer a plentiful supply of arrack. Addressing the river, she said; "Be merciful to us, O goddess, and I shall, on my return home, worship thee with a thousand jars of arrack and dishes of cooked flesh-meat.†" When crossing the Yamuná she said, "Be thou auspicious, O goddess; I am crossing thee. When my husband has accomplished his vow, I shall worship thee with a thousand head of cattle and a hundred jars of arrack." L Again, Bharata, returning from his ineffectual mission to bring back Ráma, mourns the lost glories of the capital: "No longer the exhibarating aroma of arrack, nor the enchanting scent of garlands, of sandalwood, and of agallochum now wafts through the city." After these, the presence of wine in the palaces of Rávana and Sugriva, and the greatest glory of the streets of Kiskindá having been the aroma of arrack | are not matters of wonder, seeing that those persons were

* Rámáyana, Carey's edition, III; p. 297.

† दुरावटसच्चेण मांसभूतीहरेन च।
यक्षे नां भीयतां देनि पुरीं पुनवपातता ॥
‡ स्वति द्वि तरामि नां पारयेनो पतिनेतम्।
व्यानां गोसच्चेण दुरावटस्तेन च॥

§ वादकोसदमन्यस्य साम्यमन्यस्य सूर्ण्याः ।

पन्दनागुदसन्यस्य न प्रवाति चमन्ततः ॥

१९४ थ॰ १० श्रो॰ ।

चन्दनामुद्यसाथां मन्द्रेः सुर्तमानिक्षाः । ,
 मेर्यायां भधूनाच पमाद्यसम्प्राम् ॥
 विष्याभावाचे ६६ एत ।

not included in the pale of Hinduism and the city belonged to a race of monkeys.

Buddhism must have contributed much to check the spread of drunkenness in India, as it did in putting down the consumption of flesh-meat, but it never was equal to the task of suppressing it. The Játakas and Avadánas abound in stories of drunkenness, and among the sculptures of Sánchi, several ladies of high rank, standing in the verandahs of the upper storeys of their mansions to behold religious processions in the street, are represented with attendants holding forth tazzas and flagons, which evidently were intended to contain something more potent than water or sharbat. In three lovescenes, the lovers are represented offering overflowing goblets to their mistresses, certainly not with a view to smother the flames of Cupid with a cooling draught. In a Buddhist drama, entitled Nágánanda, lately translated into English by Mr. Ralph Boyd, a scene occurs, the plot of which depends upon the vagaries of a drunkard, who had for his lady-love a maid of honor of the queen.

In the time of Kálidása drinking seems to have been very common, for we find in the Sakuntalá, the Superintendent of Police, who was no other than the king's brother-in-law, proposing, like an English policeman, or cabby, to spend the present offered him by the fisherman who recovered the lost ring, at the nearest grog shop.

- "FISHERMAN.—Here's half the money for you, my masters. It will serve to purchase the flowers you spoke of, if not to buy me your goodwill.
 - "JA'NUKA .-- Well, now, that's just as it should be.
- "SUPERINTENDENT.—My good lisherman, you are an excellent fellow, and I begin to feel quite a regard for you. Let us seal our first friendship over a glass of good liquor. Come along to the next wineshop, and we'll drink your health."*

In his graphic description of the triumphal march of Raghu, Kálidása specially notices drinking-booths set up by the soldiery at Rájamundri, to drink the famous cocoa-nut liquor of the place.† The proper way to drink it was in betel leaf cups. So profusely was this liquor partaken of, that, in the hyperbolical language of the poet, the water of the Cauvery was tainted by the smell.‡ In a subsequent part of the description, the same soldiery appear to have in Persia drunk grape-wine, seated on leather

^{*} Williams's Sakuntala, p. 153.

[†] ताम्मूकीनां दशका रिवता पानभूसयः।

नारिकेसासर्वे योषाः प्राचवस्य पपुरुषः॥ ४ । ४२ ॥

‡ स सम्परिकार्वेन जनदानसुजन्मिना ।

कावरीं सरितां पत्यः प्रस्कृतीयासिकाकरोतः॥ ४ । ४५ ॥

cushions spread under umbrageous vineyards.* A passage in the Kumára Sambhava, of the same author, extols a crystal palace on the Himálaya as so exquisite as to be best adapted for a drinking hall.† Drinking must have been common in high circles to justify this comparison. Elsewhere drinking halls, as specially reserved apartments in a palace, are frequently mentioned.

Kálidása is also lavish in his references to drinking by women of quality. In the Raghuvañsa, he makes Aja bemoan the loss of his wife, Indumati, by this apostrophe: "How will you, dear one of wine-reddened eye, who have quaffed delightful liquor from my mouth, drink the mist-befouled water which I offer with my tears." Adverting to a practice of making Vakula trees (Memusops elengi) flower by gargling wine on them, the same author says: "Sprinkled over with arrack from charming faces, the blossoms partook of the character of the liquor." Again: "Liquors, which excite delightful recreation, overcome by their bouquet the aroma of vakula flowers, never break the current of enjoyment, and are friendly to Cupid, the ladies drink with their husbands." Again, "The ladies in private drank highly exhilarating liquor from the mouth of Agnivarna, and he on his turn blossomed like the vakula by drinking of arrack from their mouths."

In the Kumara Sambhava, Rati, mourning the loss of her lord Cupid, says:—Rice liquor, which causes the reddened eyes to roll, and speech to get

- विनयने सातद्योधा मधुभिविजयत्रमम्।
 चालीशिजिनरमाद्य द्राचावलयभूमिषु॥ ४। (५॥
- † यन स्कटिकचर्येषु नक्तमापानभूमिषु ।
 च्यातिषां प्रतिविम्बानि प्राप्नुवन्यपद्मारताम् ॥
 ﴿ चर्गे ४२ स्नोकः ।
- ‡ सदिराचि ! सदाननार्पितं मध् पीला रसवत् कयं नु से । चनुपास्त्रसि वाष्यदूषितं परक्षेत्रकापनतं जलाञ्चलित् ॥ रष्ठ ० सर्वे (० ज्ञोकः ।
- शुवद्गावद्गासवसभृतस्यद्गुवादिगुणः क्वस्तुभाक्तः ।
 समुकरैरकरात्रभुलेल्युपैवंकुलमाकुलमायतप्क्किः॥
 रष्टु॰ १ सर्वे १० खेळाः।
- सिंतिविधनेष्यकं द्वरिकमपराजितकेष्ठस्।
 पतिवु निर्विविधनेषुककाः स्वर्थकं रथवाळनवर्जितस्॥
 रहु० ८ वर्ते १६ खोकः।
- चातिरेकमदकारणं रचलेन द्रममिक्षेषुरङ्गाः ।
 ताभिरयुवद्दतं मुखावनं चेऽपिनदङ्गसतुब्द्दावद्दः ॥
 रपु॰ ११ वर्ते ११ खोकः ।

disjointed at every step, has, in thy absence, become a torture to loving women."

In the 7th book of that work, when describing Siva's approach to the palace of Himalsya, the poet says that "the faces of the ladies who rushed to the windows in great haste and with half finished toilettes, to behold the procession, evolved the odour of the arrack they had drunk, and their dark eyes appeared like black bees on charming lotuses."†

Mágha, in the Sisupálabhadha describing Baladeva, says "when he spoke, the aroma of liquor which had obtained sweetness by lodging in the mouth of Revati, issued from his mouth."1

The Puranas abound in descriptions of wine and drinking, and, though the object of many of them is to condemn the use of wine, the inference is clear, that there was a widespread malady which they proposed to overcome. In some instances, moreover, the object was not reprobation, but mere description, and no less an authority than the Bhagavata Purana enjoins the use of spirit by Brahmans at the Sautramani rite, So does Vrihaspati, the high priest of the gods, whose Sanhitá is a standard authority on law. § In the Markandeya Purana, the great goddess Durga is represented as particularly addicted to strong drinks. Kuvera serves her with overflowing goblets of strong liquor, and she drinks and drinks till her eyes become flaming red, and she bursts out in wild laughter. When girding herself to prepare for her combat with the fierce demon Mahisa, she says: "Roar, roar, you fool, for a moment only, till I finish my drinking."

Other instances may be quoted ad libitum, but they are not wanted. shall abstain also from extracting more passages from the poetical literature

- नयनात्यदशनि घूर्णयन् यसनानि सबस्ययन् पदे पदे ।
 सपित स्वयि नादशीसदः प्रसद्गामसुना विद्याना ॥ ४ चर्मे १२ खेलाः।
- † तार्चा म्बेरासवग्रममें श्रीप्रान्तरासान्द्रकृतू स्लानाम्। विलासनेनअसरैर्भवाचाः सदस्पनाभरका द्वासन्॥ ० सर्वे ४२ छोकः।
- 🛨 क्षुज्ञिकन्यावक्रामानीयस्था । सुज्ञासीदं सद्दिया जतानुवाधमुद्दमन्॥ माधस्य १ घर्गे १० खोताः।
- ६ चीवासका नवा मध वृती सक्तम्बाहतं। Apud Viramitradays.
- ॥ ब्हावध्रम् सर्या पानपार्व धनाविषः। ततः मुक्ता कानाता पविका पानमुत्तवस्। वरी। पुनः पुनवेश जनाधायणकोणना ॥ तने तने चर्च तुद्द तमु यावत् पिवास्त्रचं।

of the last fifteen or sixteen hundred years to show how frequently reference are made to drinking among the higher classes of the community. But I cannot omit noticing the Tantras, which afford the most indubitable proofs of a strong attachment on the part of a large section of the Hindus to over-indulgence in spirituous drinks. These works profess to be revelations made by S'iva to his consort Párvati, and constitute the life and soul of the modern system of Hinduism. In the way of religious rites, nothing is done in the present day, and nothing has been for the last fifteen hundred years in Bengal, which does not, or did not, borrow its main characteristics from the Tantras. They govern alike the conscience of the followers of S'iva, the worshippers of S'akti. and the adorers of Vishnu. In the present day, some few ceremonies are called Vedic, and Vedic mantras are used in a great many others; but in most instances, the mantras used have been transmitted through a Tantric medium, and it may be said with very little exaggeration that the life of a Hindu from birth to burning-ground is one eternal bondage to the ordinances of the Tantras. Doubtless the Tantras are of various kinds, some Vaishnavite, others S'ivite, and others designed for the glorification of S'aktí, or the female energy, and the last two classes of works are described by the Vaishnavas, and very justly, as sanmohini or "delusive," designed with a view to mislead mankind in this sinful iron age; but even the most bigoted Vaishnava dares not question their character as revelations by S'iva, and most faithfully owns his allegiance to such Tantras as are of a Vaishpavite tendency. and S'akta Tantras are, however, much more numerous, and their followers in the present day may be reckoned by hundreds of thousands. Before the advent of Chaitanya, four hundred years ago, their influence was much greater; and the great bulk of the Hindus professed the faith inculcated in those works. The doctrine of equality which Chaitanya and his successors preached, won over over to their side the major portion of the lower orders of the people, and the Vaishnavas, therefore, now prevail in Bengal; but the Brahmans could never brook the idea of owning equality with low caste men, so most of them stuck to, and still follow, the doctrines of S'aiva or S'akte worship, and the Tantras which inculcate them give free liberty to their votaries to indulge in drinking spirits. The S'akta Tantras go further, and insist upon the use of wine as an element of devotion. According to them no worship of the Devi can be complete which is not celebrated with the five great essentials, "fish, flesh, wine, fried grain, and female society," technically called the five Ms, from the circumstance of the initial letters of their Sanskrit names being M. To describe the details of the worship would be so shocking that I cannot venture upon the task. Suffice it to say, that the Kaulas, who are the most ardent followers of the S'akta Tantras, celebrate their rites at midnight in a closed room, where they sit in a circle round a jar of country arrack, one or more young women of a lewd character being in the

company; they "drink, drink, and drink until they fall down in utter helplessness, then rising again they drink, in the hope of never having a second birth."* In such circles (Bhairavi chakra) Kaulas of all castes are admissible, for, say the Tantras, when once in the mystic circle, all castes are superior to Brahmans, though on coming out of it, they revert to their respective ranks in civil society.† It is true that this "left-handed" or secret worship (vámáchára) is observed by a few of the most ardent votaries of the sect, at long intervals; and the Tantras inculcate absolute secrecy in its performance, and disclosure is condemned as calculated to frustrate all its merits, and prove highly disreputable; but the use of wine is enjoined at the ordinary daily prayers or sandhyás, and on particular occasions it is a sine qua non. I knew a highly respectable widow lady, connected with one of the most distinguished families in Calcutta, who belonged to the Kaula sect, and had survived the 75th anniversary of her birthday, who never said her prayers, (and she did so regularly every morning and evening) without touching the point of her tongue with a tooth-pick dipped in a phial of arrack, and sprinkling a few drops of the liquor on the flowers which she offered to her god. I doubt very much if she had ever drunk a wine-glassful of arrack at once in all her life, and certain it is that she never had any idea of the pleasures of drinking; but, as a faithful Kaula, she felt herself in duty bound to observe the mandates of her religion with the greatest scrupulousness. That thousands of others do so, I have every reason to believe. In some parts of Bengal, where arrack is not easily accessible. such female votaries prepare a substitute by dropping the milk of a cocoanut in a bell-metal pot, or milk in a copper vessel, and drink a few drops of the same. Men are, however, not so abstemious, and the Tantras ordain a daily allowance of five cupsful, the cup being so made as to contain five tolás, or two ounces, i. c. they are permitted to take ten ounces or about a pint of arrack daily.

The most appropriate way of drinking liquor is in the mystic circle above noticed; but as this cannot be got up every day, the devotee takes the bulk of his potation alone after the evening prayer. He is also at liberty to drink wherever he likes, and in whatever company chance may

^{*} पीला पीला पुनः पीला पुनः पति भूतसे। जलाय च पुनः पीला पुनर्जना न विश्वते॥ महानिवासतन्त्रं।

[†] चाजता भैरवोचजो सर्वे वर्षाः दिकोत्तसाः। जिजेता भैरवीचजात् सर्वे वर्षाः प्रवस् प्रवस् ॥ ‡ पावपार्व प्रकृतित नपचतास्त्रकाणिकं।

throw in his way, provided he faithfully observes one condition, and that is, never to drink without neutralising the curse of S'ukráchárya and purifying the drink. This is done by drawing a triangular figure on the ground with the right index finger dipped in liquor, placing the flagon thereon, and repeating over it three mantras which say—(1) "Om! The great Brahma is one alone; verily, he is both material and immaterial. Through him I destroy the sin of Bráhmanicide which has originated in (the murder of) Kacha (son of Vrihaspati. (2) Om! O goddess, dweller in the orb of the sun, born in the abode of waters, and consisting of the sacred mantra of Amá, remove the curse of S'ukráchárya. (3) Om! If the Pranava be the source of the Vedas, and essentially and solely the felicity of Brahma, by it, the truth, O goddess, cast away the sin of killing Brahmans.*" After repeating the mantras, the word vans'a is to be muttered several times, and then repeating his own especially vijamantra, the votary should meditate on the form of his favourite divinity, which is generally a manifestation of Kali, and then on that of S'iva who is described as "blood red in complexion, four-handed, three-eyed, benign, beneficent, bearing a mass of matted hair on his head, a necklace of snakes round his neck, a diminutive tomtom, a skull, a club, and a noose in his hands, and arrayed in a tiger skin." Ten repetitions of the gayatri after this and of the words hum and phat effect the complete purification of the grog, and the neutralization of the curse. At the formal mystic circle. several other mantras are repeated, and some formulæ gone through; but they are not absolutely necessary for the ordinary every day ritual, or for the purification of the drink. In practice the ritual above set forth, or a modification of it, including of course the three important mantras, does not take much time, and I have seen it completed in two or three minutes. But whether an epitome is adopted, or the whole ritual be gone through, some ceremony is imperatively necessary, for the Kaula who drinks wine without purifying it, becomes a criminal of the worst class. According to the

ॐ एक मेन परं तथा स्पू ख्रू ख्रू स्थान ये भृतं।
कचा जुना त्र साम्या तेन ते ना स्थान्य ।
ॐ द्र्यमण्ड सम्भूते वर्षा स्य सम्य ।
खमावी जमये देवि स्थान सापादि मुख्यतां ॥
ॐ देवानां प्रकृते। वीजं त्र साम्य स्थान ।
तेन सत्येन ते देवि त्र सम्बन्धां यपेषता ॥
किवस्ततन्ते २ पटलः ।
राज्य वर्षा चतुर्वा इं चित्र वे वर्षा सितं।
जटा जूट घरं देवं वास्त किष्य भूषितं ॥
बनवा कपासा सुत्र रेपास नुत्र नं।
भारिषं तं यजे देवं स्था त्र च्या स्थान स्थान ।
भारिषं तं यजे देवं स्था त्र च्या स्थान स्थान ।
भारिषं तं यजे देवं स्था त्र च्या स्थान स्थान ।

Utpatti Tuntra, "the Bráhman who drinks unpurified liquor is guilty of killing a Bráhman; drinking purified arrack he becomes as pure as a flaming fire. At the Sautrámani rite and in the Kaula circle, a Bráhman should always drink arrack; but by drinking elsewhere for the mere gratification of his senses, he loses his Bráhmanhood.*

The Mátriká-bheda Tantra is most eloquent in praise of drinking. makes S'iva address his consort thus: "O sweet-speaking goddess, the salvation of Brahmans depends on drinking wine. I impart to you a truth, a great truth, O mountain-born, (when I say) that the Brahman who attends to drinking and its accompaniments forthwith becomes a S'iva. Even as water mixes with water, and metal amalgamates with metal; even as the confined space in a pot merges into the great body of surrounding space on the destruction of the confining vessel, and air commingles with air, so does, dear one, a Brahman melt in Brahma, the great soul. There is not the least doubt about this, O mountain-born. Similitude with the divinity, and other forms of liberation are designed for Kshatriyas and others; but true knowledge can never be acquired, goddess dear, without drinking wine; therefore should Bráhmans always drink. No one becomes a Bráhman by repeating the gáyatri, the mother of the Vedas; he is called a Brahman only when he has a knowledge of Brahma. The ambrosia of the gods is their Brahma, and on earth it is arrack; and because one attains the character of a god (suratva), therefore is arrack called surá.†" The work, nevertheless, will admit of no

> * चरंकातां सरां पीला त्रास्त्रोग त्रस्त्रा भवेत्। रंखाताम् सुरा पीला प्राच्ये मसद्वियत्। चीवामका क्रमाचारे त्राचाकः प्रविवेत सरा । चन्यव कामतः पीला त्राच्याचादेव चीयते ॥ † त्राचाक्य महामाचं मदापाने प्रियंवदे। ब्राह्मकः परमेशानि यदि पानादिवं चरेत ॥ तत्वकात जिनक्याती चर्य चर्य कि जैसने। ताये तायं यथा जीनं तैनमं तैनमे यथा ॥ वढे भग्ने यथाकार्य तापी वाय्यंता प्रिये। तथैव सर्पानेन नासको नसकि त्रिये॥ जीवते नाव सन्देश परमातानि शैक्के। सायुष्यादि महामार्च नियुक्तं चनियादिए ॥ मध्यानं विना देवि तत्रज्ञानं न सम्बते । चतरव दि विप्रक मध्यामं समाचरेत्॥ वेदमाता अपेनैय प्राच्यका न वि बैस्ते। त्रश्रानं यहा देवि तदा त्राश्रद उपते ॥ देवानामस्तं प्रश्व तदेव सीविधी स्टा। सरतं मेळवाचेच करा तेन प्रवीतिता ॥

drinking without the purification aforesaid. "The three mantras for the neutralization of the curse of the Bráhman (S'ukráchárya) should always be repeated. Then only does arrack become full of Brahma. Even as a fire flames up when clarified butter is poured on it, so does arrack become the giver of salvation on the neutralization of the curse. Therefore should Bráhmans always drink (after purifying his grog). Such a drinker, is a true Bráhman; he is proficient in the Vedas; he is truly an Agnihotri; he is thoroughly initiated; what more can I say, O noblest of goddesses, when I add that he rises above the three qualities (inherent in matter). This is the true path to salvation; but it should be kept a secret from bestial peopla (pásu, men who do not drink wine), for disclosure leads to want of success, and is highly disreputable."*

The Kāmākhyā Tantra speaks very much in the same vein. "Whoever," it says, "after being initiated in the salvation-giving mantra of Kālikā, fails to drink wine, is a fallen man in this iron age. He has no right to the performance of Vedic and Tāntric ceremonies; he is called unbrahman, ignorant as an elephant; and whatever oblations he offers his manes, becomes as impure as the urine of a dog. Having obtained the mantra of Kāli or Tārā, he who conducts not himself as a Vira (or hero, i. e., drinker of wine), unmistakeably acquires in his person the degradation of a S'údra." †

It will be naturally supposed that those who wrote the above panegyrio must have had various kinds of liquor for their use; and the S'astras afford the most convincing proof on this head. Pulastya, an ancient sage and author of one of the original Smritis, enumerates twelve different kinds of

* चितरारोपमाचेक विक्रदें मि यथा मनेत्। श्रापमोचनमाचेक सुरा मुक्तिप्रदायिनी ॥ चतरन चि देनेशि त्राक्कण पानमाचरेत्। स त्राक्कास से देनका सेऽग्निकोनी स दीचितः ॥ नक्क किं कथाते देनि स एन निर्मुणात्मकः । मुक्तिमार्गिम्दं देनि गोप्तथं पद्मसङ्के । प्रकाशत् सिविचानिः श्राजिन्दनीयो न चान्यथा ॥ नै कास्तिका तारिची दीचां स्वीका मयसेनमं । न करोति नरी यसु स कक्की पतितो भनेत्॥ वैदिको तान्तिको चैन जपदेशमनिक्कतः । चत्राक्कास ए एनेक्कास एन चिक्तम्वेकः ॥ ग्राजीमूनसमं तस्त तर्पनं यत् पिक्नपि । कासी तारामनुप्राप्य मीराचारं करोति न । ग्राक्कां तक्करीरेच प्रामुणात्म स न चान्यवा ॥ कासीचात्रते ॥ प्रकाः ॥ liquor besides the soma beer, which is not usually reckoned under the head of madya, and his successors have added largely to the list. The twelve principal liquors of this sage are 1, pánasa, or jack liquor; 2, dráksha, or grape liquor; 3, mádhúka, or honey liquor; 4, khárjjura, or date liquor; 5, tála, or palm liquor; 6, aikhshava, or cane liquor; 7, mádhvika, or mowa liquor; 8, saira, long pepper liquor; 9, arishta, or soap-berry liquor; 10, maireya, or rum; 11, nárikelaja, or cocoa-nut liquor; 12, surá, or arrack, otherwise called váruni or paishti.* This verse, as quoted in the S'abda-kalpadruma, gives táñka, or wood apple liquor, and the Vishnu Sanhitá koli or jujube liquor in lieu of Saìra.

The mode of preparing these liquors is briefly described in the *Matsya-s'ukta Tantra*. It says, "Place unripe jack, mango, and plums, in a jar, and pour on it daily a quantity of unboiled milk, and add some flesh meat; put therein hemp leaves and sweet lime on alternate days, and when duly fermented, distil, and this is jack wine."

For the 2nd, the grape juice is to be fermented with curds, honey and ghi, distilled in the usual way, and flavoured with manjit, and chiretta. This is of course brandy-bitter, pure and simple, dyed with manjit instead of burnt sugar. The 3rd has honey for its principal ingredient, and with it is to be associated Vidanga (a bitter drug), salep misri, long pepper, and salt. The 4th has ripe dates for its basis, and with it is mixed jack fruit, ginger and the juice of the soma vine. The 5th is made with the

* पानसं दाखमाधूकं खार्क्यूरं तालमेखनं ।

साधीकं सेरमारीष्टं मेरें यं नारिकेल्जं ॥

समानानि विजानीयान् मद्यानेकार्येव तु ।

दादमनु सुरामशं सर्वेवानधमं स्मृतं ॥

† अपन्नं पनस्केव खावच वदरं तथा ।

स्थापियला वटे नित्यं द्यादानपयः फलम् ॥

वेलोक्यविजयादेव मातुलकं तथैव च ।

समेऽडिन तता द्यान् समानात् सक्तमिरितम् ॥

‡ दिवसभुष्टतचापि मिन्नद्वं तिम्नकं तथा ।

खनुपाने तु देवेशि दाच-मद्यं सनिवित्तं ॥

§ विद्यं मालवा मूलं ।

समुना सद संस्थाय ग्रेवे पार्वं समाचरेत् ।

पियसी कवकं दला मधुना मदमीरितं ॥

॥ पानसं पक्तवार्क्यं चार्वं सामनारसं ।

स्कोहत्याग्रियमानात् बक्तरं मदमीरितम् ॥

ripe palm fruit spiced with danti (Croton polyandrum) and the leaves of the kakubha plant.* The 6th has sugar-cane for its basis, and black pepper, plums, curds, and salt for adjuncts. † The 7th is made of the blossoms of the Bassia latifolia, mixed with sugar and ripe bel fruit. The 8th is made of molasses and long pepper. The Tantra follows the reading of Rájá Rádhákanta Deva, and has tanka instead of saira, and it should be made, according to it, with the root of the Asparagas racemosus, the root of the wood-appletree, a drug called lakeman, lotus flowers, and honey. § The 9th, according to the reading of the Mitákshará, is a liquor made from soap-berry plant with molasses, but according to the Tantra of the root of the ægle marmelos, plums, and sugar. || The 10th of the above list occurs in the Tantra under the name of gaudi, or rum, made from molasses, the adjuncts during fermentation being curds, hemp leaves, and a drug called karikaná. The 11th is made of the milk, or toddy, of the cocoa-nut, mixed with plantains, ripe emblic myrobolans, and the drug Indrajihvá.** The 12th has half-boiled rice, barley, black pepper, lemon juice, ginger, and hot water for its ingredients. The rice and barley are to be digested in hot water for two days, then boiled, then spiced with the other ingredients, and allowed to ferment thoroughly, and lastly distilled. ††

- * पक्तालं दिनाशकं ककुभभ तथैव च । एतेरेव सुसन्धानात् तालमयं प्रकोत्तितम् ॥
- † इच्दर्षं मरीच्च वदरच तथा दक्षि। सेचे तु खबचं दला इच्चमसं प्रकीर्णितम्॥
- ‡ नवं मधुतचा विल्लं पर्ता सर्करया सर । सन्धानाळायते सद्यं माध्वीकं सरता रसं॥
- मालूरमूलं वदरी ग्रर्करा च तथैव च।
 एवामेकव सम्भानाम मेरेयं मदानीरितं॥
- प्रदेश वेक्षांकाविजया तथेव च करीकणा। गुक्रेन चच चन्नानात ग्रीकीमदा प्रकीर्णितम ॥
- ** रन्द्रजिका पक्षभाषी नारिकेलजलं तथा। कर्लोफललन्यानात् मधं तबारिकेलजं॥
- †† म्रज्जुकीमवैधिवाज्ञमुखोदक्षमम्बितन्। वक्षी चन्नापयेत् किचित् स्थापयिका दिनद्वयस् ॥ मेथेऽचित् तु चन्नाप्ते जोवनं तत्र निःचिपेत्। म्रज्जेरं मरीचच मातुक्तं तथेव च ॥ दतेवासेव चन्नानात् पैद्येसच् प्रकीर्तितम्॥

The arrack described in the Vedas was somewhat differently prepared from the way above detailed, as will be seen in the sequel. All the other liquors noticed in Sanskrit works were, likewise, first fermented, and then distilled; none manufactured, as European wines are, by mere fermentation. In fact, they are all spirits differently flavoured with various kinds of spices, fruits, and herbs, to suit different tastes, and not wines; and the word wine has been used in this paper in its secondary sense of intoxicating liquor.

A liquor flavoured with aniseed has enjoyed considerable celebrity in India for a long time. It is said that a celebrated Tántric pandit of Nadiá, who bore the title of Agamavágís'a, or "the Lord of the Science of Agama," was particularly fond of it, and used to take a lotá full of it every day. People, suspecting him of this weakness, watched him one evening when he was returning from his vesper prayers at the river side. He was seen to come out on the sly from a grog-shop with his water-pot filled with aniseed arrack, and taxed by a large crowd for conduct so disreputable in a Bráhman of his learning and sanctity. He denied the charge, and placed the lotá before his accusers, when lo! the pot appeared to contain milk. "A miracle, a miracle," cried the crowd, and the pandit, instead of being degraded, was canonised as the most favourite son of the Deví; the fact being, that the wily toper knew well that aniseed liquor mixed with a little water becomes milky, and had taken the precaution to doctor it so with a view to provide against possible contingencies.

Among the many omissions in Pulastya's list, the Tanka, the Koli, and the Kádamvari appear the most prominent. The name of the first is met with largely in the Tantras. The second is of rare occurrence. The last was a favourite drink of Baladeva, and was at one time held in high repute. In medical works, various other kinds of liquor are also mentioned, mostly as aphrodisiacs, but some as medicinal. The following enjoys a high repute as an invigorating tonic. I quote a passage describing it as it is the only one in which an account is given (imperfect as it is) of the still used for distillation. "Take of fresh molasses 100 palas, water 30 palas, and mix them in an earthen vessel. Take of Vávari bark (Cassia arabica?) and jujube bark five prasthas each, (a prastha is equal to 128 tolás,) a few betelnuts, 32 tolás of lodhra (Symplocos racemosa), and two palas of ginger. Dilute the molasses mixture in water, add to it successively the ginger, the Vavari bark, and the jujube bark, mix well, then cover the vessel, and lay it by for three days. Then add the betel-nuts and powdered lodhra, recover the vessel, tie down the cover, lute it, and lay it by for twenty days. Take the apparatus called mayura yantra, a strong earthen vessel of the shape of a peacock, place it on a hearth over a slow fire, pour into it the fermented mixture, and add thereto half a pala each of powdered betel-nut, sailabolaka,

^{*} A pals, according to some, is equal to 4 tolas; according to others, eight tolas,

deodar wood, cloves, padmaka (a drug), leaves of the Andropogon muricatum (a fragrant grass), sandal wood, Anithum sowa, Ligusticum ajwana, black pepper, the white and the black cummin seed, carraway, jatámansi, nutmegs, Cyprus rotundus (muthá), grinthi parni (a drug), dried ginger, methi (a spice), and small cardamums. Now cover the vessel with two upturned chatties, attach thereto two pipes, and carefully distil the liquor. This wine should be drunk daily. It promotes the secretion of the constituents of the body, and is invigorating."*

Although all the various Indian liquors are essentially the same, viz., rum, differing only in being differently flavoured, in the eye of the Hindu law, the liquors made from molasses, mowa, and rice are held to be more offensive than the others, and the punishment for drinking them, more severe.

The flavouring ingredients used in the preparation of these liquors, it is said, materially altered their virtues, and medical works prescribe different liquors for different complaints. For ordinary use the rum from molasses is described to be the most healthful in the dewy season (October and November), the arrack from paddy in the cold and rainy seasons; and the mowa liquor in spring, summer, and autumn. Connoisseurs were also formerly particular as to the age of their liquor, and the older the liquor, the better was it appreciated.

Nor were they, it would seem, content with their home manufactures, for it appears from Arrian's Periplus of the Erythrian Sea that large quantities of foreign wine were regularly imported two thousand years ago, and these met a ready sale in the country. The varieties mentioned are 1, Λαοδικηνος, or wine of Laodicea in Syria; 2, Ιταλικος or Italian wine, and 3, Αραβικος or Arabian wine.† These, from the circumstance of their having been brought

* नूतनं गुज्यद्वाद्यं अतमेनं पर्णतया।
जालं विंग्रयलं देयं स्यापयेन्नृदुभाजने ॥
वावरोतस्पद्वाद्यं वदरीतसमेव प ।
प्रस्थं प्रस्थं प्रदातसं पूर्ण देयं यथासितं ।
लोभस् कुडवं दला सार्क्तस्य पस्तद्यं।
गुडं पञ्चासनं दला दापयेक्षुदिमान् भिष्व ॥
प्रसमे सार्क्तं देयं दितीये वावरीतसं।
हतीये वदरीं दला ने।स्रिया भिष्यरः ॥
मुसे अरावनं दला स्थापयेदिवस्तयं।
पूर्व स्नोभस्त्रेष दापयेन्द्रनस्यं।
पूर्व स्नोभस्त्रेष दापयेन्द्रनस्यं।
सुसे ग्रावनं दला स्थापयेदिवस्तयं।
सुसे ग्रावनं दला यां स्वा म् वस्त्रे।
सुस्रम्भनं स्वा स्वा प्रदेशिविकातः॥
स्वस्त्रये ने।सिकापाने मयूरास्थे।प्रस्ते।

⁺ Vincent's Periplus II, Appendix, p. 67.

from distant countries, must have been much more costly than the spirituous liquors of India, and consequently none but the wealthy could afford to drink them.

The different liquors were always taken neat, and it was necessary, therefore, to take some saline, sub-acid, or sweet stuff, to remove the pungency or smarting caused in the mouth by the raw spirit. For this purpose fruits, roasted mince meat, and cakes were most approved by the higher classes, but the lower orders had to content themselves with parched or fried grains and pulses seasoned with salt and chilly. These wine biscuits were held in great requisition, and were known by various technical or slang names, such as Upadars'a, Upadañsa, Avadañsa, Chakshana, Madyapásana, Mudrá, &c. 1 have noticed the word nakula also so used in the Bengali Chandi and some of the Tantras, but I am not able to put my hand on the text of the latter just now. The word probably came from nakuli flesh-meat; but I learn from my friend Mr. Blochmann, that in Arabic the word is used in the same sense, and it is possible that some of the modern Tantras borrowed it from the Muhammadans. Anyhow the word has become generally current, and one of the names of S'iva is Nakules'a or "lord of wine biscuits," and no drinking party was formerly complete without a good supply of these tit-bits.

Looking to the nature of the climate, the character and temper of the people, and the anathemas which the S'astras have, from time to time, hurled against the drunkard, it might be taken for granted that men of the higher castes, and good people generally, did set their faces against drinking, or, at least, did preserve an outward appearance of horror against those who openly outraged the mandates of the Smriti; but it would seem that for all that cases of delirium tremens turned up pretty frequently, and several very

चयाविधि प्रकारेण सन्दसन्देन विक्रमा ॥
चुजीसधे निधातयं स्तिकाहृद्धभाजने ।
सदीवध्य तक्षधे अविदिता विनिचिपेत् ॥
गास्त्र पुग्नं दता कुसी च गजकुभावत् ।
कुससधे निधातयं पुग्य प्रेस्वशस्त्रं ॥
इत्वदाद सवक्षय पद्मकोग्रीरचन्दनं ।
ग्रासुष्यायसानी च सरिचं जीरकहृद्यं ॥
ग्रादी संचीत्रमेशा च जातीपस्त्रभुस्तः ।
पत्निपर्वी तथा ग्राप्ती सेथी सेथी च चन्दनं ॥
द्वां चावपसान् भागान् कुह्यिता विनिच्चित्।
यद्माविधिप्रकारेच चालमं दापयेत् सुधीः ॥
वृद्मित्रम् सीस्त्रं व्या चातुवस्त्रमात् ॥
दति ग्रामाचार्यविमितिता चतस्त्रीवनी सुरा ॥ • ॥

expressive names were current in the country at one time to indicate the disease. One of them means "wine horror" maddtanka, another "wine disease" maddtyaya, a third "wine complaint" madavyádhi, &c. The descriptions of the disease, as given in Sanskrit medical works, are detailed and precise, discriminating carefully between the illness caused by excess, and that by sudden abstinence after a protracted over-indulgence. These names and descriptions could not have come to existence, had there not been immoderate drinking in many instances to give rise to the complaint.

There is another indication in medical works which is worthy of note; it is the multiplicity of receipts for removing the odour of wine from the mouth. None but the rich or well-to-do could have required such prescriptions to guard against the accusation of having taken wine, and the existence of the recipes implies the existence of a class of men who were addicted to drinking, and yet wished to pass among their neighbours for teetotallers.

Of fermented beverages, which were drunk without previous distillation, four kinds are mentioned, viz. cocoa toddy, palm toddy, date toddy, and the soma nectar. The first was known only to those who inhabited the sea coasts, where alone the tree which yielded it, is met with. The acetous fermentation in its case was so rapid, that transmission of the liquor from one part of the country to another was out of the question, and none but those who lived in the neighbourhood of the tree could drink the juice in a vinous state. The date and the palm toddies suffered in the same way, and were unfit for transmission to distant places; but the trees which yielded them were common almost all over India, and so they were more easily accessible, and more widely known. But they never seem to have attained any great popularity. The soma nectar was likewise open to this objection; for it, too, had no keeping quality, and, for aught we know, was never manufactured for sale; but it was associated with the earliest history of the Aryans, even before they separated from the ancient Persians, and enjoyed the proud pre-eminence of a god as long as Vedic rites governed the conscience of the people. The Rig Veda Sanhitá is most lavish in its praise, and all the four Vedas furnish innumerable mantras for repetition at every stage of its manufacture, and from the moment a resolution was made to commence one of the rites at which it was to be used (and all the principal rites such as the Dars'a, Paurnamása, Jyotishtóma, Ukthya, Shodas'imán, Vájapeya, Atirátra, Aptaryáma, &c., could not be celebrated without it), nothing could be done without appropriate mantras, and the ritual throughout was most complicated and tedious. It would be foreign to the object of this paper to describe in any detail the several steps in the manufacture of the beverage; suffice it to say, that it was made with the expressed juice of a creeper (Asclepias acida, or Sarcostema viminalis), diluted with water, mixed with barley meal, clarified butter, and the meal of wild paddy (nivára), and fermented in a

jar for nine days.* The juice of the creeper is said to be of an acid taste, but I have not heard that it has any narcotic property; I am disposed to think. therefore, that the starch of the two kinds of meal supplied the material for the vinous fermentation, or, in other words, played the part of malt, and the soma juice served to promote vinous fermentation, flavour the beverage, and check acetous decomposition, in the same way that hop does in beer. Anyhow, it may be concluded that a beverage prepared by the vinous fermentation of barley meal, should have strong intoxicating effects. and it is not remarkable, therefore, that the Vedas should frequently refer to the exhilaration produced by its use in men and gods. The addresses to Indra, Agni, Mitra, and other gods in the Rig Veda are full of allusions to exhilaration caused by the use of the soma. "The sacred prayer, desiring your presence, offers to you both, INDRA and AGNI, for your exhibaration, the Soma libation. Beholders of all things, seated at this sacrifice upon the sacred grass, be exhilarated by drinking of the effused libation." (I. 7. xxvii. 4, 5.) Other quotations on this subject may be easily multiplied, but they are not needed. Suffice it to say that the object of drinking the soma is expressly stated to be intoxication: madáya arvenehi somakámam tváhe rayam sutastasya puá madáya ; and Indra drinks it in such large quantities, that his belly becomes enormously Uruvya chájathara ávrishasva. As regards men, its effects are distended. described as equally exhilarating and inebriating. A story occurs in the Black Yajur Veda in which a sage, Vis'varupa by name, son of Tvashtu, while engaged at a soma sacrifice, is said to have indulged so inordinately in the exhilarating beverage as to have vomited on the animals brought before him for immolation. For this, however, no proof is wanted, for the effect of some on the gods could have been only assumed by a knowledge of what it was on the worshippers.

The soma beer lasted for several days after its nine days' fermentation. In some of the rites it certainly lasted for twelve days, but how much longer I cannot ascertain. It is certain, however, that it could not be kept sound for any great length of time, without distillation, and in a distilled spirit the soma would be of no use. Accordingly, we find that no soma juice was used when arrack was distilled from fermented meal. The liquor, thus prepared, was, as already stated above, called surá, and it was used as an article of offering to the gods in two important rites, namely, the Sautrámaniand the Vajapeys. The mode of preparing it is described in the canons of Baudháyana and Kátyáyana. They recommend three articles, viz., sprouting påddy, the sprout brought on by steeping paddy in water very much in the same

Stevenson's Sáma Veda, p. 5. and Haug's Aitareya Bráhmana, I. p. 6. Manning's Ancient India, I., p. 86. For the mantras used in the course of preparing the some beverage vide, Taittiriya Sañhitá, Kánda I. Prapáthákas II. III. IV., and Kánda VI. Pt. I. to IV. The Kalpa Sútras and the Soma prayogas supply the details.

way as malt is produced, slightly parched barley steeped in curds and diluted butter milk, and coarse powder of the same steeped in whey. After proper fermentation, this was distilled in the usual way, and the liquor produced was poured in oblations on the sacred fire in lieu of the soma beer. The Taittiriya Bráhmana supplies a number of mantras for the preparation of the liquor, but I can nowhere find any description of the still in which the distillation was effected. Kátyáyana recommends that the different articles required for the manufacture of the liquor should be obtained by barter, and not by purchase with coins. In the Sautrámani rite, the offering of the liquor should be preceded by the immolation of three animals, a bull being one of them. The worshippers were required to partake of the remnant of the offerings, as the ceremony would be incomplete without the repast.

On the History of Pegu.—By Major-General SIR ARTHUR P. PHAYRE, K. C. S. I., C. B.

The chief authority which has been followed in this sketch of the history of Pegu, is a narrative written in the Taláing, or Mun, language by Tsha-yá-dán A-thwá, a Budhist monk. It was derived from ancient records and traditions, and was translated into Burmese by Máung Shwé Kyá, a learned Talaing. The chronology of the narrative is very confused, though the most important date, that of the foundation of the city of Pegu, is correctly stated. Neither the author nor the translator, however, has attempted to correct the manifest errors which exist. In this paper, the dates of the more prominent events in early times have been rectified by me from contemporary Burmese history; and in later times, from the accounts of European travellers. The few particulars which can be gathered regarding the history of Tha-htun, the most ancient city on the coast of Pegu, have been placed at my disposal by Mr. St. Andrew St. John, Assistant-Commissioner in British Burma. They were derived from MSS. in his possession. I have also had the advantage of consulting an essay in the Burmese language, on the same subject written by Maung Byan, a Talaing gentleman of ancient family. This was procured for me by Colonel D. Brown, Commissioner in Tenasscrim. I have read what has been written on the ancient history of Pegu by the Reverend Dr. Mason, in his excellent work on Burma; and have consulted the Gazetteer of Pegu, edited by Major M. Lloyd, Deputy The notices of events in Burma and Pegu by the old Portuguese voyagers, as narrated in the lucid general summary by Mr. Talboys Wheeler, and the valuable edition of the travels of Nicolo Conti in the early

part of the fifteenth century, by Mr. R. H. Major, together with other travels by Europeans, in that and the following century, have been used to correct, or to confirm, the statements in the native annals.

The country now called Pegu, or as written by the natives Bagó and Pégu, consisted in ancient times of the delta of the E-rá-wa-ti, and the land in the lower courses of the rivers Sit-taung and Than-lwin (Salwin). At different times the coast as far south as the Tenasserim River has been subject to the monarchy; while to the north the limits of the kingdom varied according to the power of the kings to defend their territory from the Bur-The northern boundary on the Erawati River, may as a general rule be fixed at A-kauk Taung, about thirty miles below the town of Prome. remote times, and long before the foundation of the city of Pegu, from which the name of the whole country was afterwards derived, the sea coast from the mouth of the Pa-thin (Bassein) River, near Cape Negrais, to the mouth of the Thán-lwin, (Salwin) was known as Rá-ma-nya, or the country of Ráma. This shows an Indian influence.* The classic name for the town of Maulamyaing (Moulmein) is still Rámapura, though this may have been transferred to it from a city once existing near the present Rangun. country of Pegu was afterwards called Hán-thá-wa-ti, which is still the classic name, and the origin and meaning of which will presently appear. etymology of the word Maulamyaing, which is the Burmese form of the Taláing name Mut-mwa-lem, signifies "one-eye-destroyed;" the tradition being that it was founded by a king having a third eye in the centre of his forehead, which was destroyed by the machination of a woman. This story, as Dr. Mason observes, suggests the legend of Siva. And though this appears at first sight to clash with the classic name Rámapura, yet from the history of Pegu, it is evident that during successive periods, the country participated in the religious revolutions of the Budhists and various Hindu sects, through which the neighbouring coast of India passed.

The earliest notice of Rámanya which can be accepted as historical is derived from a Budhist source, the Mahávanso of Ceylon. Therein is recorded the deputation of the great missionaries, Sono and Uttaro, (Thauna and Uttara), by the third Budhist synod, held at Pataliput, B. C. 241. They were sent to the country called Suvarna bhumi, (Thumanna bhumi), or "golden land," to preach the great reform determined on by the synod. The name given to the country was the Pali designation of the portion of Rámanya of which Tha-htun was the capital. The ruins of Tha-htun still exist on a small stream about ten miles from the seashore, and forty-four miles travelling distance N. N. W. from Martaban (Muttama). The city appears to have been laid out on the general plan of ancient Indian cities,

[•] The island of Ramri, or more properly Ram-byi (country of Ráma), shows the same influence.

and which has been followed in the modern capital of Burma. The ground plan of the outer rampart is a square or oblong, within which is an open space of about a hundred and fifty feet, and then a second but lower wall or rampart, and moat. The east and west inner walls are each 7700 feet long; while those on the north and south are about 4000 feet each, enclosing a space of about seven hundred acres. The angles, however, are not exact right angles. In the centre of the city is the fortified royal citadel, measuring from north to south 1080 feet, and from east to west 1150 feet. This was for the defence of the palace, the "throne room" being, as is now the case at the Burmese capital, nearly the central point of the city. There are two gates, or spaces for entrance, in the northern and southern faces of the rampart, but it is impossible to say how many on the eastern and western. Such is the description given by Mr. St. John of the present appearance of Tha-htun. The position of the city with reference to the approach from sea, is now not suitable for a port. But there is strong probability that a gradual rise of the land, including all the adjoining gulf of Martaban, has been going on for several centuries, which has destroyed the port. With this change of level it is probable that the influx of tide, called "the bore," is now more violent near the mouth of the river Thit-taung (Sittang), than it was two thousand years ago.

The traditions as well as the scanty historical notices which remain regarding Tha-htun, show that it was founded by Indian colonists. One tradition is, that the original colonists came from Thu-binga in the country of Ka-ra-náka, or Karanatta. By some this is made to refer to the founding of Maulamyaing. It may, however, be accepted as certain that people from what is now called the Coromandel Coast, established at an early period . possibly a thousand years before the Christian era, one or more trading stations on the coast of Pegu. That Tha-htun had risen to some importance as a city in the third century before Christ, is shown from its having had allotted to it missionaries at a synod held under the influence of the Budhist Constantine Asoka. The name Suvarnabhumi, or "golden land," by which the country was then known in India, probably refers to gold being exported in great quantity from the emporium. Gold, no doubt, was brought from Yunan down the Erawati River at a very early period. It continued to be an article of commerce from the same country until within the last sixteen or eighteen years, since which the trade has been interrupted.* There is also an old gold "diggings" about a hundred and twenty miles distant from Tha-htun on the Paung-laung or Sit-taung River. The town is still

In a note on the metals of Burma by Dr. T. Oldham, published in Yule's Mission to Ava, it is stated on good authority, that the annual amount of gold brought from China (Yunan) overland to Ava for some years before 1855 was 1100 ibs. weight. In one year, 1800 ibs. weight was imported.

called in Burmese Shwegyin, or "gold sifting place." Gold is indeed still found there, but not in sufficient quantity to be remunerative, except to very poor people. These facts appear to explain satisfactorily the classic name of the country. The name Tha-htun is derived from vernacular words having the same signification.

One of the early Budhist legends referred to by the native historians is to be found recorded in books still existing in the monasteries of Ceylon.* Two merchants fron Thuwanna bhumi, named Tapassu and Bhallaka, had gone on a trading expedition to Northern India. On returning with their waggons of merchandize to reach the sea coast, they passed through Magadha, where Budha was absorbed in meditation and in the seventh weeko f his fasting, in the Kiripalu forest. The merchants made an offering of honey to Budha, who, at their request, bestowed on them eight hairs of his head as These they brought to their own country, which are now believed to be enshrined in the Shwé Dagun pagoda at Rangun. This legend may be accepted as showing that at an early period, the Indian merchants of Suvarrabhumi traded to Upper India, and were considered a community of sufficient importance to have attributed to two of their body the honour of a personal interview with Budha. At a later period, the commercial importance of Suvarnabhumi is shown from the emporium Subara appearing in Ptolemy's list of places on this coast, as has been pointed out by Colonel Yule.

Concerning the first building of Tha-htun, it is related that before Gautama appeared, there reigned a certain king Ti-tha, in the city of Thu-bin-na (or Thu-bin-ga), in the country of Karanaka. He had two sons Ti-tha Kummá and Dzá-ya Kummá. The young princes determined to abandon the world and become hermits. They, therefore, left their home, and went to dwell on separate mountains, near the seaside, described as being not far from the future site of the city of Tha-htun. The whole country was then forest. Once when walking on the seashore, the brother hermits found two eggs, which had been deposited and abandoned by a female dragon, who came up out of the sea. The hermits carried away the eggs, from which in . due time issued forth two male children. The hermits brought up the boys, one of whom died at ten years of age; but being born again in Mit-ti-la, about the time of the appearance of the lord Gau-ta-ma, became, while yet a child, one of his disciples. The boy, produced from the egg taken by the elder hermit, lived in the forest until he was seventeen years of age, when by the help of Tha-kya, + he built the city of Thuwanna-bhumi, called also Thahtun, and reigned with the title of Thiha Rá-dzá. By the intercession of him who, in a former birth, had been his younger brother, but had now risen

^{*} See Spence Hardy's Manual of Budhism, page 182.

[†] Sekra, the chief of the second dewaloka, or heavenly region, answering to Indra in Hindu mythology.

to a Rahánda, the lord Gautama himself came through the air and visited Tha-htun. This was thirty-seven years before he entered Nirvána. The country is spoken of reproachfully as a land where fishermen and hunters abound, these being callings opposed to the tenets of Budhism. But the king and the people of the city listen to the preaching of Budha, and the future greatness of the country is predicted. But though the people immediately around the city were well disposed, those at a distance were savage and resentful. It is related how the great teacher, attempting to land near the mouth of the Than-lwin river, was stoned by the Bhí-lús and evil Náts who dwelt there. In these words is shadowed forth the rejection of Budhist doctrine by the native inhabitants, who afterwards became distinguished for their religious zeal.

From this time the historians of Tha-htun profess to have a list of all the kings who reigned in Thuwanna bhumi, distinct from the kings of Pegu. It is now impossible to decide how much of this list is historical and how much fictitious, until near the time of the destruction of the monarchy in the eleventh century of the Christian era. Tha-htun was then taken and destroyed by Anaurahtá, king of Pu-gán; and the king Manú-ha, with his whole family, the nobles, monks, artificers, mechanics, and skilled workmen of every description, were carried away captive. There are the names of fifty-nine kings in the list, who are said to have reigned for sixteen hundred and eighty-three years. The events of their reigns are discreetly veiled under the obscure phraseology of metrical lines. By the chronology it seems to be intended that the reign of the son of the first king Thi-ha Rádzá, commenced in the year that Gautama attained Nirvána. Taking this as a starting point and accepting the Burmese era of religion as commencing 543 B. C., then, as Thi-ha Rádzá is said to have reigned sixty years, we find the year 603 B. C. as the commencement of the monarchy. This would give the year 1080 A.D. as the year of its destruction by Anaurahta. The time thus deduced for the latter event does not differ very much, considering all things, from the Burmese account. Anaurahtá, according to the Mahá Rádzáweng, ascended the throne of Pugan in the year 1017, A. D., and reigned forty-two years. Within that period therefore he captured Tha htun. The list of the kings as given in the native chronicles is added. But it is not considered to have any historical value, except as a generally correct representation of the existence of the monarchy, and its destruction with the city, about the period stated, by the Burmese king.

Among the few facts recorded in the native annals of Tha-hfun which need be mentioned here, is the arrival of the great missionaries Thauna and Uttara, which is put down as having occurred in the year 223 of religion, being 320 B. C., instead of the true date 241 B. C. On their arrival, they and their disciples were denounced by the existing teachers as bhil-ús,

or monsters, the name here bestowed upon heretics and scoffers. They were violently opposed and beaten with sticks. But the mild demeanour of the Rahándas gradually made their authority prevail. The people were won over to believe them, and new-born children were named after them. The pagodas which had long been neglected and round which jungle had grown up, were repaired. Pleasant gardens were now planted for the resort of the religious, and the reformed doctrines were triumphant.

The only other event of importance which is mentioned in the history of Tha-htun is the introduction of the Pi-ta-kat, or books of the Budhist scriptures, by Budhaghosa. This event, so important to all the Indo-Chinese nations, is noticed by the Right Reverend Bishop Bigandet in his valuable "Life or Legend of Gautama," and the date therein ascribed to it, from Talaing or Burmese authority, is A. D. 400. Up to a recent period, the histories written by Taláings or Burmans represented Budhaghosa as a great Rahán of Tha-htun, who went to Ceylon, and brought from thence the sacred books to his native land. This statement has, however, been corrected in the latest edition of the Burmese national history (Mahá Rádzáweng), which was written, or revised, in the palace at Amarapura about forty years ago. The story of Budhaghosa is therein correctly told, and has apparently been derived from the Mahavanso of Ceylon. The date assigned for Budhaghosa's voyage to Tha-htun is A. D. 403.* Even the Taláing writers, long . jealous for the honour of their country, seem now to acknowledge their error as to the birthplace of their great teacher. In a late paper by a learned Talaing which I have perused, it is acknowledged that there are two accounts regarding Budhaghosa; and it is only argued that in returning from Ceylon to the continent of India, he may have come by ship to Tha-htun, and revived by his presence the drooping flower, religion. That Tha-htun was his native place, seems to be silently abandoned.

All that can be gathered of the early history of Tha-htun has now been noticed. The only explanation which can be offered for the entire absence of trustworthy ancient documents, and the want of details with any historic value, is the ruthless destruction of everything by Anaurahtá, king of Burma, in the eleventh century of the Christian era.† All that was movemble and worth removing, was then carried away to Pugán, and though Tha-htun still remained as a port, to which perhaps a few foreign ships resorted, the bulk of the trade passed to the city of Pegu; or was two or three centuries later established at Mut-ta-ma (Martaban).

^{*} In Max Müller's introduction to Captain Rogers' parables of Buddhaghosa, the period between A. D. 410 and 432 is stated as being that of the literary activity of the great teacher in Ceylon.

[†] See Journal of the Asiatic Society of Bengal, for 1868, on 'History of the Burma race.'

It is now time to turn to the history of Pegu. This country became known to Europeans in the fifteenth century when it was a powerful kingdom. Afterwards it long existed as a mere "geographical expression," but under other influences is once more rising to commercial greatness.

Concerning the foundation of the city of Pegu the legends relate that at the time when the lord Gautama came through the air, attended by thousands of Rahandas to visit the king of Tha-htun, the sea flowed over the whole of the low country, now occupied by Rangun and Pegu. After preaching to the king and people of Tha-htun, Budha returned through the air to go to the middle land. When passing over the sea, a small sandbank appeared, which rose above the surface of the water, shining like a silver islet; and there the lord beheld a pair of golden hánsus.* He then predicted that hereafter a great city and country would arise in that spot; for wherever golden hánsas resort, to feed and enjoy themselves, happiness and a great future are sure to follow in the land. The country, it was predicted, was to be called 'Hanthawati,' These birds were supposed to live on a beautiful lake in the midst of the Himálaya, which region was, in the imaginations of the tropic-dwelling Talkings, invested with the grandeur of immensity, not unmixed with gloom. There all kinds of lotus flowers of various colours rested on the water, amidst which, never disturbed by man, the birds slept at night, and came to their far off feeding place in the morning.

Now it so happened, according to the divine prediction, more than nine hundred years after the lord had entered Nirvana, that the silvery sandbank

* The hansa, or hentha, is still the sacred bird of Pegu. Much discussion has arisen as to its identity. It is not a native bird of the country. The Burmese and Talaings refer to the Himálaya region as its home, and while supposing it to be a superior order of wild duck or goose, describe it in such glowing but unscientific terms, that an ornithologist would be puzzled how to classify it. Spence Hardy in his " Manual of Budhism," when mentioning hán-us as inhabiting the Himálaya according to the Budhist geography, observes: "This is regarded as the king of birds, and by Europeans is generally supposed to be the golden winged swan." Colonel Yule, in his narrative of the Mission to Ava in 1855, suggests that it may be "a mythicised swan." Mr. T. T. Cooper in his book of enterprising travel to the frontier of Eastern Tibet has the following passage, which may be accepted as indicating the bird referred to in the legend. "The large yellow wild duck is met with on all the Thibetan streams and mountain pools at a great elevation. These ducks were precisely similar to the brahmini ducks of the upper waters of the Brahmaputra. I was anxious to secure a specimen and fired at the first I saw, but luckily missed, for a Lama who was with us. rushed up in great consternation. The yellow ducks were sacred to the grand Lama, and to kill one would be a great crime, even to have fired at the sacred bird was an offence." These birds are represented in the "boat scene" of Sakya's death, carved in bas-relief at Sanchi (See Cunningham's Bhilsa topes, Plate XI. Tone of them represents a former existence of Gautama's, and probably also of the future Budha Arimateya.

had risen up, so as to be plainly visible above the surface of the sea. A foreign ship which came from the city of Bij-ja-ná-ga-ran, had been on a trading voyage to Tha-htun, and in returning passed near the sandbank. The tide was falling and the sailors saw a number of golden hanthas feeding and disporting themselves after their kind. One pair was conspicuous above the rest. The sailors looked and wondered. When they reached their own country, they related what they had seen. Their story reached the king Ban-du-rá-reng. The king's teacher being a man of learning, well read in the scriptures, knew that the lord Gautama had been to that country, and that what had been seen by the sailors was an omen of its future greatness. By his advice, the king determined to secure for his descendants the spot where the hanthas had been seen. He, therefore, had a stone pillar engraved with his name and title. This was conveyed in a ship to the spot, and deposited in the sea, close to the silvery sandbank. After this, when one hundred and sixty years had passed, the silvery sandbank had risen much higher and become firm land. King Banduráreng had passed away, and his grandson Ku-wa-tha Na-reng now reigned. He knowing all that had occurred, sent a ship under a wise man of high rank to make search for the stone pillar deposited by his grandfather, and so to prove his right to the land.

Now at this time A-din-na Rádzá was king of Tha-htun. He was jealous for religion, and had succeeded his father Thin-na-geng-ga to the exclusion of two half-brothers, whose succession had been favoured by his father during his lifetime. The story of their birth is thus told. On the sea-shore, far from the habitations of men, a female dragon came and laid an egg. A hermit who dwelt in a cave hard by, found the egg and took it to his home. In seven days a female child was produced from the egg, who was brought up by the hermit. When grown up, she was married to king Thin-na-gengga, and raised to the rank of chief queen. She gave birth to two sons, who were named Thamala and Wimala. The queen, notwithstanding her beauty and the high favour of the king, was always an object of aversion among the nobles of the court, though it was not then known that she was of the Nága or dragon race. This was discovered by the sagacity of the king's teacher, and she then died suddenly in a very mysterious manner. Her two sons were sent away to the hermit, who was called their grandfather. and who brought them up in the forest. On the death of their father, another son of his, called A-din-na Rádzá, succeeded to the throne. The two young princes, by the advice of the hermit, determined to build a city for themselves to the west, on the land where the hermit knew the golden hansas used to feed, and where he lord Gautama had predicted that a great city would arise. They, therefore, collected one hundred and seventy families from the country of Tha-htun, and embarked them on bamboo rafts, ten families on

each. They floated down the stream on the banks of which the rafts had been made, and after many perils, reached the spot where the city Han-tháwa-ti was to be built. Some people who dwelt on the west side of the river, numbering in all three hundred and thirty families, now joined the two princes, who thus had with them in all five hundred families. When they were considering how to lay out the city, they were suddenly joined by two venerable men, who were Tha-kya Meng (Sekra, or Indra), and an attendant deva. They appeared in the guise of carpenters, with instruments, measures, and ropes, and offered to help the princes. This offer was accepted with joy; but when they were about to measure the ground, the nobleman who had been sent by the king of Bij-ja-ná-ga-ran appeared with his followers. and claimed the ground for his master. The two princes replied saying, "You are foreigners, you have no right to our native land." The nobleman answered that when thirteen fathoms of water existed over the spot, an ironstone pillar, with the name, title, and seal of the king of Bij-ja-ná-ga-ran had been placed there. The disguised Tha-gya Meng now replied for the princes that a golden pillar had been placed in that spot before the stonepillar had been deposited, on which their names were inscribed, and it would be found deeper down than the other. It was argued, therefore, to dig for the pillars, and the right to the land was to be determined by the ownership of the older pillar. Now Tha-gya Meng foresaw by his superior sagacity that, if western foreigners were to be supreme in this land, false heretical opinions would arise; whereas the divine prediction was, that true religion was to be built up; the bidagát (pitakattaya) was to be recited and reverenced, and holy relics were to be worshipped. He, therefore, created a golden pillar, on which were inscribed the names of former kings of Tha-htun, and by his power it was conveyed under ground ten fathoms beneath the stone pillar of the Kulás (western foreigners). So when they assembled to dig. and the Kulás had found their stone pillar, Tha-gyá Meng said, "Yours "is true, but it was placed after ours, which is deeper down, and by which "our claim will be proved." The Kulas replied, "If you have an inscrib-"ed pillar beneath ours, we will acknowledge ourselves defeated." Then they dug down, and lo! at ten fathoms depth was found a golden pillar, with a date more ancient than that on the stone pillar. The Kulás then acknowledged themselves defeated, and went away taking their stone pillar with them. The spot where the golden pillar was found, being the place where the golden hansas fed, was made the centre from which the city was marked out. Tha-gya Meng measured the ground with a rope on which pearls were strung, so that the land might be sacred, and set apart for ever, free from the rule and ownership of foreigners, or any but its own princes. . The golden pillar was moved a little to the south, and a pagoda was then built within which it was enshrined, and in memory of the defeat of the

foreigners it was called, in the Mun language, Kyaik-tsa-né, and in Burmese Ranaung-myin-phrá.* The city was founded in the year of the lord's Nirvána 1116, being equivalent to A. D. 573. Thá-ma-la Kummá, the elder of the two brothers, was now consecrated king.

In the story of the foundation of the city of Pegu, and the events which led to it, we appear to have the legendary version of the struggle for ascendancy between Brahman and Budhist. This struggle was still going on in parts of Southern India in the sixth century of the Christian era, and it would no doubt be extended to the colonies and settlements on the coast of Rámanya. The kings of Tha-htun and the principal citizens were of Indian descent, and they probably participated in the changes which were going on in the parent country. The foundation of Pegu, by emigrants of Tha-htun, tells both of a dynastic and perhaps a religious quarrel. The Budhist party eventually successful, represent the founders of Pegu as being of their faith, and their opponents as heretics and foreigners, though the latter reproach was probably the feeling of a later period. One cause of the separation for Tha-htun appears to have been the Nága, dragon or snake, worship, which, as has been shown by Mr. Fergusson in his learned work, extensively prevailed about this time in India; and the founders of Pegu are stated to have been of Nága descent or, in other words, had added snake worship to the reverence, which, by the precepts of Budhism, should be shown only to the memory or relics of Budha. If this be so, the reform in their worship was made, as was the case in Burma, at a later period. From tradition and such scanty historical notices as have survived, we are led to look to the east coast of India, and especially to the country in the lower courses of the rivers Kistna and Godávarí, with the adjoining districts, in other words ancient Kalinga and Talingana, as the countries which at a very early period traded with and colonized the coast of Pegu. The people of Pegu are known to the Burmese, to the Indians, and thence to Europeans. by the name Talaing. This word is derived from Talingana, and the name which was strictly applicable only to the foreign settlers, has in the course of time become applied to the whole people. As has already been stated. they call themselves Mon, Mun, or Mwun, a word which will hereafter be considered. The names given in the histories of Tha-htun and Pegu to the first kings of those cities are Indian; but they cannot be accepted as being historically true. The countries from which the kings are said to have derived their origin are Karannáka, Kalinga, Thubinga, and Bij-ja-ná-ga-ran. These may be recognised as Karnúta, Kalinga, Venga, and Vizianagaram. on the south-eastern coast of India. The last has, in after times, probably

^{*} The classic name of the city Hen-thá-wa-ti, or Han-sá-wa-ti, has already been explained. The common name, Pegu or Ba-go, is said to mean in the Mun language "conquered by stratagem," alluding to the incident above related.

been mistaken for the more famous Vijayanagar, the modern city on the Tambudra river. The word Talingána never occurs in the Peguan histories, but only the more ancient name Kalinga. The names of the more prominent kings of Tha-htun and Pegu, all occur in Indian lists, and have probably been selected as pertaining to orthodox Budhists, or as being famous in early legend. Thus king Tiktha, Ti-tha, or Tissa, of Karannáka, whose sons are represented as first coming to Tha-htun, is probably the name of Asoka's brother Tishya. The name frequently occurs among the early Budhist kings of Ceylon. The elder son is called after his father with the affix Kummá; while the name of the younger Dzá-ya, is apparently Ja-ya Sinha, the founder of the Chalukya race in Talingana, whom Sir Walter Elliot* supposes to have lived in the early part of the fifth century of the Christian era, and Mr. Fergusson about a century later. The eastern branch of this line reigned in Vengidesa, which comprised the districts between the Godávari and the Kistna, below the Ghats, and eventually fixed their capital at Rajamahendri. In the history of Tha-htun, though the two sons of king Tiktha become hermits, they adopt two sons, one of whom builds the city of Tha-htun, and reigns there under the title of Thi-ha Ridzá. This name is probably derived from that of Raja Sinha, the posthumous son of Jaya Sinha above mentioned, who succeeded after a struggle to his father's power, and whose birth and alliance by marriage with his enemies the Pallavas, the possessors of the country south of the Narbadá, are reproduced at Tha-htun in the dubious birth of Thi-ha Radza from a dragon's egg, though he is brought up by the hermit Dzá-va. The kings of the Chalukya dynasty who reigned for about five centuries, were of lunar race, and apparently worshippers of Vishnu. † The establishment of this family caused the flight and exile of numbers of Budhists, or quasi-Budhists, from the districts on the seacoast of Talingána. On this point Sir Walter Elliot has made the following remarks in a communication with which he has favoured me. "There is no "doubt, the intercourse between the east coast of India, and the whole of "the opposite coast of the Bay of Bengal and the Straits of Malacca, was far "greater in former times than at present. It had attained its height at the "time that the Budhists were in the ascendant, that is, during the first five

See Numismatic Gleanings, Madras Journal of Literature and Science, Vol. XX.
 Also, Indian Chronology, by J. Fergusson, Journal R. A. Society, 1869.

[†] The coins of these kings were stampt with the figure of a boar, and thence came to be called 'varáha mudra.' A large number of gold coins bearing this device, and with characters pronounced by Sir Walter Elliot to be an ancient form of Telagu, were found some years ago on the Island of Cheduba, on the coast of Arakan. They were probably of the fifth century. They were found not far from the sea shore disposed as if hidden by persons wrecked on the coast, or otherwise landing suddenly. They were not at all worn by usage. One of these coins was figured and described by Captain T. Latter, in Jour. As. Soc. of Bengal, Vol. XV., p. 240.

"or six centuries of our era. The first great Budhist persecution both checked it and also drove great numbers of the victims to the opposite coast. The Tamil and Telugu local histories and traditions are full of such marratives. When the Chalukya prince, brother of the king of Kalyan, was founding a new kingdom at Rajamahendri, which involved the rooting out and dispersion of the pre-existing rulers, nothing is more probable than that some of the fugitives should have found their way to Pegu. One Tamil MS. refers to a party of Budhist exiles, headed by a king of Mandu, flying in their ships from the coast."

The building of the city of Pegu in A.D. 573, by emigrants from Thahtum under the princes Tha-ma-la and Wi-ma-la, together with the attempted occupation of the site by the representatives of the king of Bij-ja-ná-garan, have already been related and commented on. There appears no reason for doubting the general facts of the narrative; and it may be admitted that the princes and people of Indian descent in Rámanya, while having causes for dissension among themselves, may have resisted the attempted establishment of a new dynasty from Talingána. But as has already been observed as regards the names of the early kings of Tha-htun, so the names of the actors in the scenes at Pegu, have probably been taken in after times from the chronicles of Talingána, or even of the modern state of Vijayanagar. The name Vimala occurs in the list of kings of the latter state so late as A. D. 1158. I have not found the name Thamala, but the term Malla as a surname occurs constantly among the Chalukya kings of the western line, commencing with Yuddha Malla in A. D. 680.

The early establishment of a colony, or city for trade, on the coast of Rámanya by settlers from Talingána, satisfactorily accounts for the name Taláing, by which the people of Pegu are known to the Burmese and to all peoples of the west. But the Peguans call themselves by a different name. It remains then to be inquired whether we can trace from what race they are descended; whether, like the peoples around them—the Burmese, the Siamese, and the Karens—they belong to the Indo-Chinese family, a branch of the Mongoloids of Huxley, or come from another stock.

The people of Pegu, as has already been stated, call themselves Mun, Mwun, or Mon. Their original language has almost disappeared. It is probable that there are not now one hundred families in Pegu proper, in which it is spoken as their vernacular tongue. In the province of Martaban, however, including a part of Maulamyaing, there are thousands who still speak the Mun language only. These are chiefly the descendants of emigrants who left Pegu in 1826, when the British army retired and occupied the Tenasserim territory. The Burmese, since the conquest of Pegu by Alompra (Alaung Phrá) in 1757-58, had strongly discouraged the use of the Mun language. After the war with the British, the language of the people

who had welcomed the invader, was furiously proscribed. It was forbidden to be taught in the Budhist monasteries or elsewhere. The result has been that in little more than a century, the language of about a million of people has become extinct.*

In physical appearance, the Mun people are scarcely distinguishable from the Burmese. They are, however, shorter and stouter, and notwithstanding their more southern position, are generally lighter in complexion than Burmese of the same class. Indeed the higher classes of the Muns. and those whose callings in cities and towns do not involve much exposure to the sun, are much fairer than those of the same classes in upper Burma. This may be partly attributable to the large admixture of Shan blood from Zimmé and the adjoining states, which occurred at a comparatively late period of their history. But there are also climatic causes. For about six months of the year, the sky of Pegu is more or less obscured with clouds; and the habit of carrying umbrellas as a protection against sun and rain is much more common with the Talaings than among the Burmese. But the question of complexion among many Indo-Chinese tribes is certainly perplexing. Some of the Karen tribes in the mountains, especially the younger people, are not darker than southern Europeans; while those settled in the delta of the Eráwati, are much the same in that respect as the Mun people among whom they dwell. While then the physical characteristics of the Mun would lead us to class them with the Indo-Chinese around them, their language points to a different conclusion. I believe this peculiarity was first brought to notice by the Rev. Dr. Mason, Missionary to the Karen people. That learned man has, in his work on Burma, pointed out the remarkable similarity between the language of the Mun of Pegu, and that of the Horo or Mundá people of Chutiá Nágpúr, called the Kols. The first syllable of the word Mundá, which is used, as I understand, to designate the language of several tribes in the western highlands of Bengal, rather than as a tribal name, is identical in sound with the race name of the people of Pegu. connection of the two peoples as shown by the similarity of their languages in a series of test words, has been commented on by the Honourable Mr. Campbell in a paper on the Races of India in the Journal of the Ethnological Society. We appear then to be forced to the conclusion, that the Mun or Talaing people of Pegu, are of the same stock as the Kols, and other

^{*} There are, however, some thousands of the Mun people in Siam, who emigrated there towards the end of the 18th and in the early part of the 19th centuries, to escape the end of the Burmese. Descendants of Mun colonists from Thathan were heard of by Dr. Richardson, in April 1837, as being located on the northern free, tier of the Karenni country. They were said to have been originally placed there by king Naurahtá, being a part of his captives. It would be interesting to know if their language remains unaltered.

aboriginal tribes of India, who may have occupied that country before even the Dravidians entered it. Csoma de Köros, in his Tibetan Dictionary, defines Mon as a general name for the hill people between the plains of India and Tibet. Assuming that a people having that name, once inhabited the eastern Himálaya region, and migrated to the south, we have now no means of tracing whether the Mun of Pegu came direct down the course of the Eráwati, or parting from their kinsmen the Kolarian tribes in the lower course of the Ganges or Brahmaputra, came through Arakan to their present seat. There appear now to be no indications of their presence, either in Arakan or in the country of the Upper Erawati; though more careful inquiry into the languages of some of the wild hill tribes, between Arakan and Manipur, might possibly show their track. The Dravidians of Talingána, who beyond all doubt came by sea to the eastern shores of the Bay of Bengal, probably a thousand years before the Christian era, found the Mun rude savages, who even some five centuries later, are called bhilus, or ogres. Yet the Dravidian colonists have been merged into the mass of that wild race. Their name indeed remains in the word Talaing, but it is known only to foreigners, and is not acknowledged in the language of the people. Though the alphabet used by the Mun is derived from an Indian source, through the Dravidians, there is probably little or no trace of the language of that race in the Mun tongue.

The city of Pegu having been founded, the historians of the Mun people thenceforth make it the centre round which the fortune of their race revolves. Thamala was consecrated king by the solemn ceremony of bithéka, or water poured on the body, and assumed the title of Mahimu Thamala Kummára. This king is stated to have built the city of Mutamau (Mutama, or Martaban), three years after the foundation of Pegu; and he founded other cities in the territory he reigned over. But after a reign of twelve years, his younger brother Wimala conspired against him and put him to death. Thamala left a son who then was seven years old. He was concealed by his mother and sent to a wild district in the hills, east of the Tsit-taung River, where he was brought up amidst a herd of wild buffaloes.

Wimala was consecrated king. In the third year of his reign, he built the city of Tsit-taung (Sittang). After he had reigned five years, in the year 590, A. D., the king of Bij-ja-ná-ga-ran sent an army with seven ships, and a champion seven cubits high, to conquer Han-thá-wa-ti. It was agreed that the quarrel should be decided by a fight between two champions. The whole country was searched, but king Wimala and his nobles could find no one to meet the Kulá giant. At length appeared the lost prince, the son of Thamala, who now was sixteen years old. He fought and slew the giant. His uncle now offered to abdicate the throne; but he would not consent to reign, and again retired to the forest, east of the Tsit-táung River. There

he built the city of Ka-thá in the mountains. King Wimala died not long after, and the young prince then became king with the title of Kathá Kummá. His reign was prosperous, but lasted only for seven years. Thirteen kings are represented as succeeding these founders of the kingdom, but the hereditary succession was broken by usurpers. The monarchy, however, gradually established its power over the whole country of Rámanya, from Puthin (Bassein) on the west, to Mutamau on the east. Tha-htun appears to have gradually declined, and remained merely as a city and sea port with little territory. The sixteenth king of Pegu, an usurper, is named Punnarika, or brahman-heart, which indicates religious strife as introduced at this time (A. D. 746). He is said, however, to have been eminently religious, and even to have listened daily to the preaching of the Budhist Raháns. But he is represented as inclined towards the ancient Hindu traditions; for he built, or re-established, the city of Aramana, which is said anciently to have occupied the site of the present city of Ran-gun. He called this city Kámanágo, or city of Káma. At this time, says the Taláing historian, as if anxious to save the king's character as a Budhist, the land of the Shwé Takun (Dagon) was not distinctly marked off, so that no impious encroachment was made. To the north of this city was built another, which was called Rámawati, now Mengaládun. This king died after a reign of fifteen years. Both his name and the occurrence of Ráma in the name of two cities he built, indicate an actual or attempted revival of Hinduism.

Punnarika was succeeded by his son Tiktha or Tissa, who was very different in his religious views, but who was at length converted and became a sincere believer. In the early part of his life, he was ensuared in the heretical doctrines of Dewadat, rejected the Bidagat, and would neither worship the pagodas, nor listen to the preaching of the Raháns, nor follow the learning of the Brahmans. Not content with this, he destroyed the pagodas. mutilated the holy images and flung them into the river; he prohibited by proclamation the worship of these or of holy relics, and threatened with the punishment of death all who should dare to disobey his decree. The people were dismayed, and remained helpless, but were rescued from peril by a miraculous occurrence. There was a young girl in the city of Han-thá-wa-ti, the daughter of a wealthy merchant, who had been religiously brought up by her mother, and from the age of ten years had listened to the preaching of the law. Badra Devi was sincerely devoted to the worship of the three treasures. She was sixteen years old when the order went forth to throw the holy images into the water. One morning, she went, as was her costom. surrounded by her attendants, to bathe in the stream, and seeing a golden image which had been flung into the water, she drew it out, saying, "Who has done this wicked deed?" The chief attendant replied, "Ledy; the king " has ordered this, and will put to death any one who worships the holy

"images and relics." The maiden said, "I will devote my life to the three " treasures, and will endure death rather than forsake them." She then carefully washed the image, and set it up in a zavát which was close by. News of this was soon carried to the palace, and the king in a fierce rage called for Badra Devi. When the messengers arrived, the maiden was still employed in cleaning and decorating the holy image, and she entreated them to let her complete her pious work. Having finished, she then with her attendants proceeded to the palace. When the king heard the report of the messengers, he raged like a hungry lion at the sight of harmless animals. He ordered that the maiden should forthwith be trampled to death by a mad elephant. The master of the elephants having brought a mad one, the animal was urged on to crush the maiden. But she invoked the protection of the three treasures, and the seven good nats, while she prayed for blessings on the king, on the elephant, and on its driver. The elephant could not be made to hurt her. Again and again he was urged on with violence, but he would not obey. The king then ordered that she should be burnt with fire. thickly enveloped with straw, but the straw could not be kindled. then ordered that she should be brought before him. She appeared with becoming modesty and respect, while the king bawled out contemptuously, "Thou hast taken thy teacher's image out of the water, and placed it in a "zayat; if the image will fly through the air into my presence, I will spare "thy life; but if not, thy body shall be cut into seven pieces." Badra Devi begged to be allowed to go to the zayat, and respectfully to invite the holy image. She and her attendants therefore went, and certain nobles of the court were sent to watch them. The maiden prayed to the three treasures and the seven good nats, that the image might fly through the air to the king's palace. Then straightway the image, the maiden, her attendants, and the nobles, were borne through the air to the royal feet. The king much astonished, said: "Let the Dewadat teachers fly through the air, so that all the people may see them." But they could not do so. The king then believed the truth, and banished the false teachers from his country. Then asking the consent of her parents, he married Badra Devi, and she was consecrated chief Queen. The pagodas and other holy buildings were now repaired, and the people rejoiced greatly. King Tiktha reigned for twenty years, and with him closes the line of seventeen kings who represent the three native dynasties of Pegu.

A gap now occurs in the narrative of events which the native historians either have not attempted to bridge over, or have noticed with by a few general statements. In a preliminary sketch to the copy of the history which I possess, it is stated that the first seventeen kings, extending from the foundation of the city of Hanthawati to king Tiktha, reigned for a period of five hundred years. But in the detailed account of the reigns of those

kings, the sum of the years they are stated to have reigned, amounts to only two hundred and eight. The first part of the history then closes as if a great crisis had been endured. A new chapter is opened which simply states that the destinies of Hanthawati were accomplished; the line of kings broken; and the writer then bursts forth in lamentation over the rule of foreign Burmese kings and their hateful governors. Three of these are mentioned and reviled, and the narrative then passes on to events near the close of the thirteenth century of the Christian era, when Mongols and Turks overthrew the Burmese monarchy; Pugan was captured, and her king a fugitive. Supposing that the seventeen kings represent in some fashion the events of five hundred years, then the close of king Tiktha's reign would be about A. D. 1073. From that time until the capture of the Burmese capital by the Mongols, there is a period of about two hundred and eleven years. . of which the Mun chroniclers say nothing, except the loss of their native kings, and the rule of three hated foreign governors. This hiatus is not peculiar to the manuscript history which I possess, but may be traced in others. Thus Dr. Mason from the copy which he followed, dates the foundation of Pegu A. D. 573 and the death of Tik-tha A. D. 841, but immediately after this, there is a blank of more than three hundred years. In Major Lloyd's Gazetteer of the District of Rangun, in which a list of the kings of Pegu is given from native records, this blank does not appear. But that is. because the foundation of Hanthawati has been post-dated to A. D. 1152, a year quite impossible to be reconciled with the histories of Burma, Tha-htun, and the subsequent history of Pegu itself. The cause of these great discrepancies arises from the Talaing historians having sought to conceal the religious revolutions in their country, during the ninth and tenth centuries. and to avoid narrating the conquest of their country by Anaurahta, king of Pugan. about A. D. 1050, with its continued subjection to Burma for more than two hundred years. And it is strange that in the Burmese Mahá Radzá weng. though the conquest of Tha-htun is narrated at great length, nothing is said of the occupation of the city Hanthawati. Yet no doubt, the city was then taken by the Burmese king. Either then it was supposed that the capture of the ancient city of Tha-htun rendered special mention of Pegu unnecessary, or the chroniclers hesitated to record the first instance of the falsification of the legend, which in the cause of religion assigned to Pegu a perpetual succession of kings in the line of Thamala kumára. The Talaing historians have endeavoured to represent their country as having been uniformly orthodox Budhist, while the records they present to us, show . that there have been frequent alternations of Budhism and Brahmanism. The names of the two last kings of the native dynasty, Punnarika and Tiktha, with the few notices we have regarding them, show that their reigns represent periods of religious strife between the two great sects, and

the attempted introduction of a form of worship antagonistic to both. Punnarika, or "brahman-heart," sufficiently indicates the influence during one period; while the name Tiktha, or Tishza, identical with that of the brother of Asoka, points to a corrupt Budhism, and the re-establishment of that worship. This is typified in the pleasing legend of Badra Devi, and Budhism has been the cherished religion of the people from that time until now.

From the time of Anaurahta the history of Pegu becomes clearer. The measures of his successors in that country are constantly referred to in Burmese history. His son and successor Tsau-lú appointed his fosterbrother Ra-man Kan governor of Pegu. But he ungratefully rebelled, and marched with a large army of Talaings against Pugán. At first he was successful, but was at length killed. In the reign of A-laung-tsi-thu, which extended from A. D. 1085 to 1160, Bassein was the principal port of departure for Ceylon, with which island there was much communication. This king sent an army of one hundred thousand Taláings, to place the exiled son of the king of Arakan on the throne of his ancestors. From this time until near the final destruction of Pugán about A. D. 1277, or by one reckoning 1284, there is ample evidence that the Burmese were supreme in Pegu. During this period, the Shans had come down from Zimmé, and occupied the country east of the Than-lwin (Salwin) River. The time was at hand when they were to become supreme. With the capture of Pugán by the hordes of Kublai Khan, Pegu began to revive. The Burmese king called from his flight Taruk-pyé Meng, fled from his capital to Bassein. ready no doubt to embark for Ceylon if necessary. The Taruk did not follow, but left the country, and the king returned to his capital. But the Burmese monarchy was now tottering, and in the confusion which arose, the Talking people found the opportunity to recover their independence, though under a foreign dynasty of kings.

The Mun chronicles thus relate the events which led to the re-establishment of the kingdom.

"Now at this time, the country of Hanthawati paid tribute to the king of Pugán, and officers were appointed to rule these, and were relieved in turn. A youth of Burman race, named Akhamwun, lived with his father and mother near the city, and was placed for instruction in a monastery, where he became a probationer. The Abbot soon perceived that he was a youth of great ability, and judged that from the accumulation of former merit, he would become a great man. After passing the grade of a Thamané, he left the monastery, and married into a Talaing family. Being appointed an officer in one of the royal boats, he in time took his turn of daty at Pugán, where he attracted the attention of the king by his zeal and energy, and was promoted to the command of the boat. One

" night he dreamed that he stood with one foot in Hanthawati, and one foot "in Pugán, which a Brahman interpreted to mean that he would become a "king. On the return of his boat to Pegu, he was careful in collecting "what was due from the people, to prevent extertion, and having become "popular through the help of his father-in-law, many of the merchants and "wealthy citizens joined him. His first care was to repair the city walls, "which had been suffered to go to decay. The king of Pugán hearing of "this plot, appointed his son-in-law Commander-in-Chief of an army to "reduce the city to obedience. This army was defeated, as well as a second. "and at last Akhimwun proclaimed himself king with the title of Thu-nek-"khautsá Rádzi." These events occurred, it is stated, about the Burmese vear 635, or A. D. 1273, but the dates given in the Mun chronicle are not to be depended on. Probably the Burmese usurper had at this time sufficient power to be practically independent; but it is not likely that he proclaimed himself king before the fall of Pugán, which, as we have already stated, was some years later.

Akhámwun no sooner was king than he belied all the promise of his former life, and by his tyranny became hated. He was at length put to death by his brother-in-law Long-gyá, after he had reigned two years. Leng-gyá had possession of the pala e for eight days, and was then killed by Akhyémwun, who was also a brother-in-law of Akhámwun. Akhyémwun was now consecrated king of Pegu with the title of Tarabyá.

At this time Muttama (Martabau) had become independent of Pegu. It was ruled by Wa-ré-ru, who had deposed the Burmese governor A-lim-ma and put him to death. The kings of Muttama and Pegu, feeling that they must combine, made an agreement of friendship, and each married the other's daughter. Taruk-pyémeng, who was still king of Pugán, sent an army under Rádzá Then-gyán, to reduce Pegu to obedience. The king of Pegu occupied the stronghold of Than-lyeng (Syriam), and had a stockade at Ta-kun. The Burmese force was at Dala. The positions were all so strong, that neither party would make an attack. Waréru then came with an army to the assistance of his ally, and the two kings advanced by land and water against Dala. They were entirely successful, and after several actions, the Burmese were forced to retire. The allied kings followed the Burmese up the Erawati as far as Padaung. They then returned and encamped at Makan, south of the city of Pegu. Here dissension arose between the two kings which ended in a fight. Tarabyá was defeated and fled. Wa-ré-ru at once marched, and took possession of the palace and capital. Tarabyá was captured by some villagers and delivered up as to his rival, who, at the intercession of the Budhist monks, spared his life. Wa-ré-ru, now king of the whole country, did not choose to fix the seat of his government at Pegu, but after having settled the affairs of the country, returned to Muttamar taking Tarabyá with him. The deposed king was soon after put to death for entering into a conspiracy.

Of the birth and parentage of Wa-ré-ru there are conflicting accounts. The history which I follow, relates that there was at Muttama a merchant of the name of Magadu who traded to the adjoining countries. To the east was the country of Thuk-ka-té, the name of the ancient capital of Siam. or the ancient seat of the royal family, situated on a branch of the river Menam. Magadu went to Thuk-katé, and entered the service of the king of that country. He either possessed a female elephant which gave birth to a white one, or he captured a white one in the forest, which he presented to the king. This was regarded as an omen of his future high destiny. On returning to Muttama, he raised a rebellion against Alimma, the Burmese governor, and put him to death.* After this, there is some obscurity in the narrative as to the fate of Magadu, and it might almost be supposed that he disappeared. But this arises from the respectful reserve of the chronicler, who refrains from stating distinctly that the quondam merchant Magadu became king of Muttama under the name of Wa-ré-ru. It is intimated that his great fortune resulted from the merit of his good deeds in former births. In fact, he was descended from one of the Nat-Bhilu who listened to the preaching of Budha, when he came to the wild region east of Tha-htun, instead of joining those who impiously drove him away. Thus he is claimed as a Mun by race, though it is probable that he was descended from a Shan family from the eastward, which had settled in the country of the lower Than-lwin (Salwin).

Wa-ré-ru was now king of Mut-ta-ma. He was anxious to possess a white elephant, which is the great object of the ambition of a Budhist king, and especially of an usurper, as it is supposed to indicate his true royal descent. After much negociation with the king of Thuk-ka-té, or Siam, a white elephant was forwarded by that monarch. This occurred in the Burmese year 655 (A. D. 1293), six years after Waréru had become king. As the strength of his kingdom lay in the country of the Salwin, where the Shans had been settling for several generations, the king made Muttama his capital, though, as we have already seen, he had dethroned Tarabyá and occupied Pegu. The Taláing historians, however, as he did not reign in their ancient capital, do not include his name among the kings of Hantháwati.

After the fall of the ancient Burmese monarchy, the Shan chief A-thengkha-yá, with his two brothers, ruled at Myin-tsaing what still remained of the empire. Having heard of the fame of Waréru's white elephant, he determined to possess it. He marched with an army to Muttama and demanded that the sacred animal should be delivered to him. This was refused,

^{*} In the Burmese Mahi Ridzi weng, the year of Alim-mi's death is said to have been A. D., 1881.

and in a battle which took place, the Shan-Burman army suffered a complete defeat. After this, the kingdom had peace for some years. But the two sons of Tarabyá, who were kept in the palace, conspired against Wa-ré-ru, and put him to death. They, however, had no supporters, and were obliged to fly. They took refuge in a monastery, but were dragged forth and killed. Their bodies were brought and laid at the feet of the king's body, and the three were burnt together. King Waréru died thus in the year 668, after a reign of nineteen years.

He was succeeded by his brother Khun-lau, whose first care was to solicit recognition of his title from the king of Siam. This was granted, and the regalia were forwarded to him with a suitable title. Not long after this, the king of Zimmé attacked Dunwun, a city on the east side of the Tsittáung river, and plundered it. The king took no measures to defend his territory, and seeing that he was a man of no capacity and careless of the honour of his country, Meng Bala, who was married to his sister, conspired against him. He was persuaded to go out in the forest, under pretence of entrapping a wild elephant said to have three tusks. Having inveigled him into the thick depths of the forest, he was put to death after a reign of four years.

Meng Bala at first intended to seize the throne himself, but by the prudent advice of his wife, he made their eldest son, Dzáu-áu, king. The young king was married to a daughter of the king of Siam. But notwithstanding this alliance, he before long was involved in hostilities with La-bun, a small Shan state then tributary to Siam. He sent a force and occupied it in the year 682. In the following year, he marched an army under Khunmeng as Commander-in-Chief to take Dhawé (Tavoy). The city having surrendered, the general marched on to Tanengthári (Tenasserim), which he took without difficulty. He left garrisons and governors in both those cities, and then returned to Muttama with the remainder of his army. During the reign of Dzáu-áu, the country was prosperous. But the king's life was short, and he died after a reign of thirteen years. The kingdom of Muttama which included Pegu, had now become independent of Siam, and from the still disturbed state of Burma, it had nothing to fear from that country: But in this reign first commenced the quarrel between Pegu and Siam, which in long after years led to wars, terribly destructive to life, and which have been the main cause of the present depopulation of the country. The quarrel was continued, when Burma succeeded by conquest to the rights of Pegu, and lasted down to the early part of the present century.

The successor of Dzśu-śu was his brother, Dzśu-dzip, who, at his consecration, assumed the title of Binyaranda. This king, after consulting with his nobles, determined to change the seat of government to Hanthawati. He went there in great state leaving a governor and a sufficient garrison at

Muttama. Soon after reaching Pegu, he went to Takun (Rangun), repaired the great pagoda and made offerings. The governors of Puthin' (Bassein) and Myoung-mya rebelled, but were soon overcome. Though the kingdom in the delta of Erawati was thus consolidated, the southern provinces were lost, the king of Siam having retaken Dhawé and Tanengthári. Binvaranda, though unable to retain those distant possessions, thought the time was favourable for making an attack on Prome. That city has always been an object of keen contest between the kings of Burma, and Pegu. At this time, the chiefs of Shan descent who reigned in Burma, had not consolidated their power, and some subordinate chief, whose name is unknown, was supreme in Prome. Binyaranda went against that city with a considerable army, but he was repulsed and killed in the year 692 (A. D. 1330). In the confusion which arose on the king's death, an officer of the palace at Muttama, called Dib-ban Meng, seized the throne and made one of Binyaranda's daughters, named Tsanda Meng IIIá, his queen. He was, however, put to death by the Commander-in-Chief on the seventh day of his reign. few weeks also, a son of Dziu-iu reigned with the title of Egin-kan, but by the influence of the queen who hated him, he was poisoned.

The person now called to the throne was a son of Khun láu, who at this time was governor of Hanthawati; for, notwithstanding the change made by Binyaranda, the palace and seat of government seems to have been again at Muttama. Queen Tsanda Mong Hlá invite l the governor to come and settle all disputes. He came to Muttaina with a large retinue, and was at once consecrated king with the title of Binya-é-lau. Tsanda Meng IIIa became chief queen. The king of Siam was angered, because E-gán-kan was the son of his daughter, and he sent an army to avenge the death of his grandson. His army was completely defeated, and the two countries were now at deadly enmity. Though Muttama was now free from a foreign enemy, it suffered from a struggle between the king's son Tsau-é-lan and his nephew Binya-ú, a son of king Dzáu-dzip. While the king was lying sick, these young princes disturbed the country by their quarrel for the succession. The king recovered and placed Binya-ú in jail, but on the intercession of the queen, released him. Before long, his own son died, which left the succession undisputed. Binya lau reigned eighteen years, and died in the year 710, A. D. 1348. His reign on the whole was prosperous, but it is noted as a had omen that the white elephant broke one of his tusks; that a severe famine desolated the country; and that there were constant border frays with the Burmese on the northern frontier.

Binya-ú succeeded without any opposition, and assumed the title of Tsheng-phyú-sheng. After he had been on the throne for three years, an attack was made by the Yun Shans of Zimmé on Dun-wun and several towns in Tsit-táung. The country was plundored, but the enemy was at

last driven out. The king, anxious to possess a holy relic, sent a nobleman in a ship with five hundred followers, and a letter written on golden tablets to the king of Ceylon, to ask for a relic of Budha. The king of Ceylon, full of friendship and beneficence, granted the request, and placing the holy relic in a golden vase, which was enclosed in other vases, all carefully sealed up, delivered it to the Peguan envoy. It was brought to Muttama, where it was received with great pomp by the king. A pagoda was built for its reception at the spot where the Yun Shans had been defeated.* Notwithstanding this happy event, misfortunes began to gather round the king. The governor of Pegu rebelled. He was subdued; but the white elephant, in Budhist phrase, 'erred,' that is, died; and the whole population, from the king to the peasant, clergy and laity, were in an agony of grief. For this portended dire misfortunes to the country. The white elephant received a grand funeral, the body being drawn by the people on a car beneath a-royal canopy, outside the city where it was buried in the earth. " But one account," adds the chronicler doubtfully, "is, that the elephant rose up from "the funeral car, and stalked majestically into the river, where the water "closed over it, and it was seen no more." Some Karen people, not long after, reported that a white elephant had been seen in the forest, and the king, with his whole court and a large army, went to capture it. He was absent for four months, and during that time, his half brother or cousin, named Byát-ta-bá, raised a rebellion. The first intimation the king had of this event was from seeing a star strike at the moon. This was interpreted by his Brahman astrologer to mean rebellion. Returning hastily towards the city, the king heard that Byát-ta-bá had shut the gates, and that his brothers were levying men in the country outside, with whom they entered. The city was defended with cannon, t so that the king could not attack it, and the wives and families of the nobles who were in the royal camp, were inside the city. Many therefore deserted the king, and went over to the rebels. The king retired to Dunwun, and appointed his brother-in-law Thamin Byá-tabat, general against the rebels. He closely invested the city, so as to prevent supplies being carried into it. By an artifice of the wife of Byát-ta-bá, who sent a secret letter to him, pretending that she was on the side of the king, he accepted some dishes which she sent, and died from the effects of eating them. The whole of the investing army then fled. Another commander

[•] In the historios of Burma and Pegu, many instances are related of relics, or supposed relics, being brought to the country from Ceylon. The facts are gravely related, but nothing seems to be known of the relics afterwards, except the hairs of Budha which are enshrined beneath the Shwé Dagun, and are as freshly remembered and worshipped now, as they were two thousand four hundred years ago.

[†] This is the first mention of cannon in the history, about the year A. D. 1870. Nothing is said as to where they were procured from.

was then appointed; but he was killed by a bullet almost immediately, and his army broke up and dispersed. The king now in despair shut himself up in Dunwun city, which was situated between Muttama and Tsit-taung.

Byát-ta-bá, though so far successful, knowing that many of the people of Muttamá were not well inclined towards him, sent a letter and messengers to the king of Zimmé, asking for assistance, and offering to hold Muttamá as his general and deputy. Hearing of this, Binya-ú seeing that his position was becoming desperate, himself sent messengers and presents to the king of Zimmé and offered one of his daughters in marriage. This was accepted: the march of the Zimmé troops was stopped, and Binya-ú, though unable to recover what he had lost, was not disturbed at Dunwun. There he remained for six years. Byat-ta-ba in the meantime strengthened his position, and at length gained possession of Dun-wun by a stratagem. king fled on an elephant almost alone, and came to the city of Pegu. was in the year 732 (A.D. 1370), being the twenty-second of his reign. Byát-ta-bá had now firmly established himself in Muttamá, and to show his sympathy with the southern Thái people, made his subjects shave their heads in the Siamese fashion. The only opposition to this order was shown in Dunwun.

Binya-ú now turned his attention to the districts of Pegu which were put in order, and walls were built round the chief cities. After a time, by tacit understanding, there was peace between him and Byát-ta-bá. The king caused the great pagodas, Shwé Maudau and Shwé Dagun to be repaired. His son Binya-nwé caused him much anxiety by his intrigues. The king wished one of his younger sons to succeed him, but did not formally appoint him heir-apparent. Binya-nwé finding his father under the influence of the queen against him, began to gather friends to support his interests. Having secretly engaged followers, he left the city at night and joined them. He took possession of the town and pagoda at Ta-kun, where he engaged the services of some western foreigners.* This was in the month Na-yun 745 (A. D. 1383), when there was an eclipse of the sun. The king was now too ill to make any exertions to uphold his authority, and all orders were issued by the queen. An army was sent against the prince, which he went out and defeated. He did not feel strong enough to attack the capital until he had collected a larger force. He then marched, and while on the way heard of the death of his father. This event stopped all resistance. Thamin Paru, the general who had been employed against him, attempted to escape, but was made prisoner and put to death. Binyanwé ascended the palace in the month Tabodwé, 747, A. D. 1885.

[•] Most probably Muhammadan adventurers from India or the Persian Gulf. They had been consing to this coast for many years past.

[†] In the Burmese history, this event is placed in the year 745. See Journal, As. See, of Bengal, Vol. XXXVII, for 1869.

The young king assumed the title of Rádzá-di-rít. He rewarded all those who had supported him, and put very few of his enemies to death. The queen had bitterly opposed him, yet, in remembrance of her care of him when he was a child, after his own mother's death, he now treated her with respect and honour. There was one powerful nobleman who had opposed him, and who was still unsubdued. This was Lauk-byá, the governor of Myaung-mya, who was of the royal family. He hated Rádzá-dirít, whom he denounced as no son of Binya-ú's, and was determined not to submit to him. He now caused the renewal of the struggle between Burma and Pegu, which had ceased for about a century, or since the fall of the Pugán monarchy, and which only ended in the entire subjection of Pegu about the middle of the eighteenth century.

At this time, Ava was the capital of Burma, and the king Tárabyá, though said to be descended from the ancient kings of Pugan, and also through his mother from the family of the three Shan brothers who succeeded them, was essentially the chief of a Shan dynasty. The king of Pegu belonged to a southern branch of the same race. Láuk-byá seeing that the king of Ava had subdued all his enemies, sent messengers to him, offering, if he were placed on the throne of Pegu, to hold it as a tributary king. The king of Ava therefore sent an army, composed of two columns under the command of his sons, to carry out this plan. One of these marched by the E-rá-wa-ti to Láing, and one by the Tsittaung or Paung-laung River to Taungu. Both were defeated by Radzadirit before Lauk-bya could arrive to support either, and they retreated to Ava. The history of Pegu states that the king of Ava accompanied his army on this expedition, but this does not agree with the Burmese history. The king of Pegu was sensible that his victory resulted more from the difficulties in the country which the Burmese army had to encounter, than from the superiority of the force he was able to bring against them. He, therefore, sent envoys to Ava with a letter and presents, hoping to establish friendship with the dreaded monarch. But the king of Ava remarked that the letter was a short one, and sternly replied that the Ta-laing country belonged to his ancestors, and would be recovered. The presents were scornfully rejected, and the envoys returned sorrowfully to their master. Thus the present king of Burma showed his determination to recover, if possible, all that had once belonged to the kings of Pugén; and Rádzádirit had nothing for it but to prepare for resistance. Lauk-byá addressed the king of Ava, excusing himself for not having appeared with a force to support the Burmese army, and again tendering his allegiance. When the season arrived, Tarabya marched down the valley of the Erawati, and as in the previous campaign, established himself at Laing. The king of Pegu was entrenched in a strong position at Mau-

bi, a few miles to the north of Ta-kun. This stockade the Burmese could not take, and were delayed so long before it, that the dreaded rainy season approached. They made a sudden retreat, which turned into a disorderly flight. The Mun army pursued them as far as Prome, but did not venture to attack that city. Being thus rid of the invader, the king determined to reduce to obedience those near him who were dangerous. first directed his attention to the eastward. He attacked and took Dunwun, the chief of which city had been in communication with Lauk-bya. He next took Lagwunpyin, and from thence sent one of his officers to Byat-ta-ba does not appear to have remained in the attack Muttamá. city, which was defended by two officers having the foreign names of E-braun and U-lé.* They had several decked boats useful for service on the rivers and creeks, and did not wait to be attacked in the city, but fought a battle outside. The army of the king of Pegu suffered severely, but in a second action this check was retained, and the two commanders of the Mataban army, fearing to enter the city, fled in decked boats to the Kulá country. Byát-ta-bá appears to have accompanied them. The citizens at once submitted, and Rúdzádirit coming to Muttamá appointed governors to it, and to Maulamyaing. These events occurred in the year 750 (A.D. 1388), and the king then returned to Pegu.

Rádzádirít now determined to attack Láuk-byá in Myáung-myá. He went against that place with a large force, but finding it too strong, he advanced against Pu-thin (Bassein), where Lauk-bya's three sons commanded. He attacked, but the foreign decked boats were armed with firearms, and the Pegu force lost many killed and wounded. The general was among the former. His body was brought away and buried by the king's command at the foot of the Ta-kun pageda. The Pegu force retreated towards Myaung-mya. The Puthin force being very strong in boats, followed under the command of Lauk-shin, one of the sons of Lauk-bya, but suffered a defeat. The king remained at Dala to direct operations and a portion of Lauk-bya's force was destroyed; he himself was made prisoner and Myaung-mya surrendered. The king then pushed on to Pu-thin, and Lauk-shin put all his valuables on elephants, intending to join the king of Prome. But being intercepted, he crossed the mountains into Arakan. and went to Than-dwé. An army followed and demanded that he should be given up. The governor surrendered him, and he was made a pagodaslave at the Shwé-dagun. His wife being of the royal family, was spared and sent to Muttama. This was in the year 752, A. D. 1390. The

^{*} From the decked boats and the names of the commanders, which are probably Ibráhím and 'Alf or Walf, there evidently were foreigners in high command at this time. No mention is made of fire-arms in these operations, but immediately afterwards there is, in the account of the attack on Bassein.

king now beautified the city of Hanthawati. In the following year he collected a force at Pu-thin, with which he advanced against the city or fort of Ku-dwut on the frontier, which had been occupied by the king of Burma. The Burmese retired on his approach, and he strengthened the place. During his absence he suspected his eldest son of conspiring against him and had him put to death. The prince died protesting his innocence, and openly wishing that he might be born king of a neighbouring country to take his revenge for this injustice.

The king of Siam sent a white elephant and a letter, acknowledging Rádzádirít as being of the same race as himself. Soon after, the king of Ava came suddenly to attack the fort of Ku-dwut. An army was sent to support the garrison, and the king of Burma retired. Rádzádirít now had leisure to attend to the affairs of his kingdom.

The king of Ava, Meng kyi-tswá Tsau-ké, died, and was succeeded by his son Tsheng-phyú sheng. But he was soon after murdered, and his brother Meng Khaung was placed on the throne in the year 763. About this time, we learn from the histories of Arakan and Burma, that a quarrel arose between those two countries, though the causes are not distinctly stated. In the former it is related that, in the year 756 (A. D. 1394), the king of Arakan marched to attack the Burmese territory. But in the latter history, this event is placed in the year 765, which agrees better with the chronicles of Pegu.* From whatever cause this difference of date may have arisen, it is certain that, about the latter period, the king of Burma being engaged in a dispute with Arakan, and also, as the history of Pegu states, from discontent existing in the southern provinces, Rádzádirit thought he saw his opportunity to take revenge for the invasions of Meng kyi-tswá Tsauké. He assembled a large army, and a flotilla of boats to proceed by the Erawati. There were four thousand boats of every description. The army moved partly by land and partly by water. The king himself left the city in the month Natdáu 766, A. D. 1404. He proceeded up the river, the army reached Prome, which was held for the king of Ava by Byan-khyi, one of the sons of Lauk Bya. The town was too strong to be attacked, and the king pushed on for the capital. By means of his large flotilla and army combined, he was able to invest the capital, but could make no impression on the walls. Rádzádirit had full command of all the country outside the city, and even sent a strong detachment up to Tagaung, the ancient capital. Probably he found himself in a difficulty and was glad to retire, but the history states that he did so in compliance with the representations of an eloquent Budhist monk. He built a monastery at Shwé-kyet-yet, near Ava,

See History of Arakan, Jour. As. Soc. of Beugal, for 1844; and History of the Burms Race, Vol. XXXVIII. for 1869.

with materials obtained by breaking up some of his boats; but this was afterwards burnt by order of Meng Kháung. The king on his way down the river was much annoyed by the Burmese troops; and on reaching Tsalé, he heard that his daughter who had accompanied her husband on. the expedition, had been taken prisoner. At first in his rage he determined to attack Prome, but his general Amát Din pointed out that the army was disordered and required rest. He, therefore, proceeded down to Pegu. Arrived at Dala, he put to death Tsáu-ma-shet, his son-in-law, who had fled when his daughter was captured. The king then returned to the city. But his anger had not subsided. No sooner was the rainy season at an end, than he gathered his forces, and advanced up the river. Determining to reduce Prome, he established his headquarters on the western bank of the river. Having defeated a Burmese force near the city, he posted three regiments on the ground to the north, on the Naweng River, in order to prevent any relief arriving. But the king of Ava was now marching down with a large army. Rádzádirít was urged by his general to withdraw the three detached regiments; but he was persuaded by others to let them remain intrenched where they were. They were attacked and utterly overwhelmed by king Meng Khaung, who then relieved Prome. But though the king of Ava was thus successful, the king of Pegu by means of his flotilla cut off his supplies by river, and destroyed the towns and villages on the banks as far as Magwé and Malun. Meng Kháung then proposed that they should make peace, and presents and friendly messages were exchanged. They swore friendship at the great pagoda of Prome, and the boundary of their kingdoms was fixed a little to the south of the city. Yet notwithstanding this agreement, the king of Ava took offence at a Taláing garrison being left at a post on the frontier, and before long began to take measures for disturbing Pegu. He desired to attack Arakan, and to prevent the king of Pegu from interfering, sent a letter to the king of Zimmé, requesting him to march an army to the frontier of Tsit-tung. This letter was intercepted, and the bearers of it were put to death. The king also knowing that preparations were being made for a march into Arakan, sent an army to Pu-thin (Bassein), to be ready for whatever might be required. The Burmese army marched into Arakan, and the king of that country fled to Bengal.* His son Na-ra-mit-hla came south to Thandwe, and communicating with Radzadirit crossed to Pu-thin. The king then promised to support him, and sent on his army to Thandwe. Ka-ma-ru, the son-in-law of Meng Khaung, had been appointed governor of Arakan, with the title of Anau-ra-htá. He was at the

[•] This event is stated in the history of Arakan to have occurred in the reign of Meng-tasu-mwun in the year 768, A. D. 1406. See History of Arakan, A. S. Bengal, for 1844.

capital in the northern part of the kingdom. The Taláing army marched there, the Arakanese Prince accompanying it. Kámarú fled from the capital, but he was taken prisoner with his wife and family, and sent to Bassein, where Rádzádirit still was. As his father-in-law had broken the treaty without cause, he was put to death, and his wife, the daughter of the king of Ava, was made one of the queens. Prince Na-ra-mit-hlá was placed on the throne of Arakan, and the Taláing army returned.

During these transactions Meng Kháung had been employed in putting down a rebellion among the Shans of Bamau and other states. When he heard that his son-in-law and daughter were prisoners, he assembled an army, chiefly Shans from Kalé and Monyin, and moved on Pegu. He marched by the Ra-mé-then route, and thence down the valley of the Paung-laung. Rádzádirit collected an army to meet the enemy at the frontier of his kingdom. The Talaings met with a defeat, and were forced to abandon a fortified post at Tha-kyin, where they had much rice stored. Rádzádirit retreated to Pan-gyán. The Burmans as they advanced burnt all the villages, and the Taláings harassed the enemy by cutting off his foraging parties. When the seat of war reached the low country where the tides prevail, the Shans unaccustomed to them became bewildered, and a large body of them being inveigled on to a sand bank in the river, was suddenly overwhelmed in the rising water. This success, and reinforcements which reached Rádzádirít from Bassein, encouraged the Taláings, and the Shan army began to suffer from the want of supplies. King Meng Khaung, by the advice of his officers, thought it prudent to negociate. He, therefore, wrote a letter adverting to his daughter being with Rádzádirít, and proposing that his son should marry a daughter of the latter. But the king of Pegu knew that the Burmese army was in distress, he therefore returned a rough answer. Several messages passed, and a personal meeting was agreed to. The king of Pegu had determined to seize his enemy, and Meng Khaung at the last moment, suspecting treachery, turned back. La-gwun-in, a Taláing officer, now undertook to capture the king of Burma. By a sudden night attack he penetrated to the tent of the king, and even possessed himself of the royal sword and pan box. Meng Khaung escaped by an accident, and now being thoroughly alarmed commenced a retreat. He was followed to the frontier by the Taláing army, after which Rádzádirít returned to his capital in triumph. But though thus successful, he deemed it expedient to enter into an alliance with the king of Ava. He, therefore, sent him a letter full of friendly words with presents, and asked for his sister in marriage. After some delay this was agreed to. The princess Wimála Devi went down the river in a royal boat, and was received by Rádzádirit at Ta-kun (Rangun), where the marriage was solemnized. But this alliance was of no avail to

preserve peace. Not long after, prince Thid-dat, brother of Meng Khaung, conspired against the king, and being discovered, fled to Pegu. There he was received with distinction, and he induced Rádzádirít to withhold an annual gift of thirty elephants, which he had promised to send to Ava. Meng Khaung, enraged at this breach of faith, determined at once to attack Pegu. In vain his ministers represented that the rainy season was at hand, and a campaign in Pegu hazardous. The king would brook no delay. Pushing on heedlessly at the head of a body of cavalry, he was suddenly attacked by the Talaing general, with whom was prince Thid-dat. The king of Ava was entirely defeated, and escaping from the field with difficulty, retreated to his own country. Rádzádirít enraged that his enemy had eluded his grasp, for Thid-dat had promised to capture his brother, put the prince to death. The king of Ava made another attack after the rainy season of 767 (A. D. 1405), but it was unsuccessful. At this time it is stated that Rádzádirít had some Europeans in his gervice

A more formidable invasion was now preparing than any yet hurled against Pegu. The army was placed under the command of the king's son, Meng-ré-kyau-tswá, who was now seventeen years of age. The story of the marvellous birth of this young prince is told without any doubt of its truth. At the time when Radzidirit was employed in the Myoungmyá district against Láuk-byá, he suspected, as has already been mentioned, that his son Báu-láu-kwon-dáu, who was at the capital, was conspiring to usurp the throne. He caused him to be put to death. But the young prince was innocent, and in dying invoked the powers of nature, that he might be born again in a neighbouring kingdom, and revenge his unjust death on his father and his country. Transmigrating, he was born of one of the wives of Meng Khaung, and from marks indicating future greatness received the name of Meng-ré-kyáu-tswá.* Now in the year 768, the was appointed to command the invading force, which by land and water numbered twenty thousand men. The prince proceeded down the Eráwati and entered the Bassein District, where he captured a stockade which had lately been built at De-ba-thwé. At this time Rádzádirít was detained at Muttama, which was threatened with an attack by the Shans of Zimmé. The prince next attacked Myoung-mya, which was so well defended, that he was obliged to retire. He also failed against Bassein and Khé-báung. The following year he marched across the hills into Arakan. The king of that country, Naramit-hla fled, and the prince ap-

The same story is told in the Burmese history. See Jour. A. Soc. Bengal, Vol. XXXVIII.

[†] Year 772, by the Burmese history.

pointed governors to Arakan* and Thandwé, and then returned to Ava. The danger from the Shans of Zimmé having passed, Rádzádirít returned to his capital. As Naramit-hlá was the hereditary king of Arakan, the king of Pegu determined to restore him. He sent a force which occupied Thandwé. They then heard that the king of Arakan had fled to Dacca. The Burmese prince now returned with an army to retake Thandwé, but by a false report of a large army approaching, retired. Soon after, a relieving force did arrive from Muttama, and the commanders who had held Thandwé, pushed on to the capital of Arakan, which the Burmese governor abandoned and fled.

At this time Prome was held for the king of Ava by a son-in-law of Lauk-bya. Radzadirit thought there was an opportunity to take the place, as the prince of Ava was engaged against the chief of Thein-ni. He advanced up the river in the month Nát-dáu, 774 (A. D. 1412), but was almost immediately recalled by news of Muttama being threatened by an attack from Siam. He at once returned with a part of his army, leaving his son Binya Pathin as Commander-in-Chief. That officer deemed it prudent to retire from Prome. He, therefore, stockaded himself at Tha-létsi, on the west bank of the river. The king of Ava soon arrived with an army at Prome, and a month later Meng-ré-kyáu-tswá joined him. They made an attack by land and water on the fort at Tha-lé-tsi. But the Taláing garrison had firearms in abundance, and destroyed numbers of the enemy, and the rest were driven back in confusion. The Burmese king then blockaded the work. King Rádzádirít approached with an army, and it was agreed to have a fair fight between two war boats, one on either side. La-gwun-in commanded the boat on the Talking side, but he was overcome and killed by a treacherous attack from four Burmese boats, under Meng-ré-kyau-tswá. After this, the king of Pegu commenced a retreat. The Burmese prince followed by water and attacked the Talaing flotilla near Tarukmáu. Both sides suffered severely, but Rádzádirít hastened the retreat of his army by land and water, and himself went on ahead with his body-guard. The Burmese army followed, and, entering the delta, successively occupied Dala, Ta-kun, Than-lyeng, and Mháubí. Rádzádirít entrenched himself at Kha-má-byín. For several months the two armies were engaged in various combats until the Taláing army gained a victory over Meng-ré-kyáu-tswi. The Burmese army then retreated.

In Arakan the Taláing commanders having heard that their king had suffered a defeat, evacuated that country, and brought their army to Bassein. Rádzádirít suspected that one or both of these officers had been bribed by the king of Ava. One of them was put to death, but the other

^{*} In the history of Arakan this event is recorded in the year 768.

was promoted. The king of Pegu now repaired the defences of his principal towns and citics.

When the rainy season had passed, a Burmese force once more came down by land and water. It consisted of not less than 100,000 men, 300 elephants, and 3000 horses. The king of Arakan who had been placed on the throne of that country by Meng Khaung, appeared as commander of one of the divisions. The Prince Meng-ré-kyáu-tswá, who was Commander-in-Chief, proceeded down the Bassein River and took Khé-báung by storm, in the month Tabodwé, 775 (A.D., 1413). The Taláings, however, determined to hold out in every place, and one of the king's sons had his head-quarters at Pan-go. Their superiority in boats enabled them to intercept the communications of the Burmese, and to cut off their supplies. The king of Taung-ú marched down with a force to create a diversion, but was met and checked on the frontier. The prince of Ava, though long inactive at Khé-baung, at length left it and proceeded towards Pan-go. The Talaings dared not attack him. He fought an action partly on land and water, and defeated the Talaing army, taking prisoner Tha-min pa-ran. The prince then proceeded to attack Bassein, but after losing many of his men, was obliged to retire. He proceeded next to Myoung-mya hoping to take it, but failed. He then went up to Ava taking with him many prisoners of importance, whom he presented to his father. He then married, and brought his wife Sheng-meng-hla down to Pegu. He at once proceeded to attack Dala. He did not succeed, but the stars according to .the astrologers were so adverse to Pegu, that Rádzádirít retired with all his family to Muttama. The Burmese prince hearing that the Talaing general Amát-din had left Bassein, suddenly appeared before that city, the governor of which surrendered. Indians and Europeans are mentioned as being in the garrison. The prince then went to Myoung-mya, which also surrendered, and having built some decked boats proceeded to attack Than-lyeng. It was defended by Binyarán, a son of the king's, and the attack failed. The prince then returned to the entrenched position he had established not far from Dala, and closely invested the Talaing force there. At this time, the king of Ava was attacked by a Chinese army, and the dispute was settled by a duel between a Chinese champion and the Talaing officer Thaminparan who had been taken prisoner, as already related.* Dala was gallantly defended by the Talkings, though they were starving. The king of Pegu recovering from his alarm returned to his capital and determined to relieve Dala. As he approached, the Burmese prince drew off his force, and the king sending a few men into the city, followed the prince's army. Several days of skirmishing occurred, and at length when the Burmese head-quarters were

See History, of Burma, Jour. A. Soc. Bengal, Vol. XXXVIII. for 1869.

at Tsha-bé-tsha-kan, the prince prepared for battle. He gave his elephant three cups of spirit and drank some himself, then remarking to his wife that the cry of the sarus which he heard was a good omen, he went forth. In the battle which ensued, the prince received a mortal wound, and his army fled. Radzádirit ordered that he should be buried with royal honours. The Burmese army now retired, and, on the retreat, the Prince's wife Sheng-meng-hlá was taken prisoner. It is said that king Meng Khaung himself came down to Dala and was shown the spot where his son's bones had been buried. He then had them put into a golden vase and sunk them at the mouth of the river. Again in the following year 776, (A. D. 1411) he came with an army, but though he defeated and took prisoner Binya Tsek, one of the king's sons, the expedition failed, and he returned to Ava. This was the last invasion of Pegu during the reign of Rádzádirit. Both nations were exhausted by the destructive wars they had waged. King Meng Kháung died five years later, and Rádzádirit devoted himself to religion and good works for the rest of his days. "He opened communication with the king of Ceylon, whose daughter he married, and from whom he received a tooth relic which was enshrined in a pagoda 186 cubits high. He also repaired the Shwé máu-dáu pagoda. to which he gave a new hti. Though no longer active, he one day went out into the jungle to capture a wild elephant. When throwing the moose, he received a blow from the animal which broke his leg, and he died before he could be brought home. This was the end of Rá-dza-di-rit, in the year 783 (A. D. 1421).

No. 1.—List of the kings of Suvarna Bhumi, or Tha-htun, from the native chronicles.

1 Thi-ha Rá-dzá. Tho

2 Thiri Dhamma Thauka.

The first king. He died the your Gautama entered Nirvana.

B. C. 543.

3 Titha.

4 Dhammá Pá-la.

5 Dham-ma dhadza.

. 6 Eng-gu-ra.

7 Uba-de-wa Meng.

8 Thi-wa-rit.

9 Dzau-ta-kummá.

10 Dham-má Thau-ka.

11 Uttara.

12 Ká-tha-wun.

18 Mahá-thá-la.

14 A-ra-ka.

15 Na-ra-thú-ra.

16 Ma-há-Bad-da-ra.

- 17 A-da-ra.
- 18 An-gu-la.
- 19 U-run-na-ta.
- 20 Mahá Thuganda.
- 21 Thuganda Rádzá.
- 22 Brahmadát.
- 23 Manya Rádzá.
- 24 A-di-ka.
- 25 Ma-rá-di Rádzá.
- 26 Tha-du-ka.
- 27 Dham-ma bi-yá.
- 28 Thu-da-thá.
- 29 Dip-pa Rádzá.
- 30 A-thek-ka Rádzá.
- 31 Bhum-ma Rádzá.
- 32 Man-da Rádzá.
- 33 Ma-hing-tha Rádzá.
- 34 Dham-ma tsek-ka-ran.
- 35 Thu-tsan ba-di.
- 36 Bad-da-ra Rádzá.
- 37 Na-ra-thú Rádzá.
- 38 Tsam-bú-dí-pa.
- 39 Ke-tha-rit Rádzá.
- 40 Wi-dza-ya Kum-má.
- 41 Ma-ni Rádzá.
- 42 Tek-ka meng
- 43 Ku-tha Rádzá.
- 44 Dip-pa Rádzá.
- 45 Na-ra Rádzá.
- 46 Rá-dzá Thúra.
- 47 Tsit-ta Rádzá.
- 48 Di-ga Rádzá.
- 49 Ut-ta-ma Rádzá.
- 50 Thi-ri Rádzá.
- 51 Dham-ma Rádzá.
- 52 Má-há Tsit-ta.
- 53 Gan-da Rádzá.
- 54 Dzé-ya Rádzá.
- 55 Thu-ma-na Rádzá.
- 56 Man-da-ka Rádzá.
- 57 A-min-na Rádzá.
- 58 U-din-na Rádzá.
- 59 Ma-nú-ha Meng.

• Manúha (No. 59) was king of Tha-htun when the city was taken and destroyed by Anaurahtá, king of Pugán, about the year A. D. 1050.

No. 2.—List of the Kings of Pegu from the foundation of the city.

LES OF KINGS.		of reign.	lo i	ลองอ	
Mahimu Thamala Kumára, Wimala, Katha Kum-má, Mahimu Arinda Rádzá, Mahimu Rádzá, Geinda Rádzá, Mahiyu Mig-ga dib-ba Rádzá, Mahiyu Mig-ga dib-ba Rádzá, Gara-wi-ka Rádzá, Tsan-da-la Rádzá, At-thá Rádzá, At-thá Rádzá, Mahimu Mig-ga-dib-ba ngó, Mahimu Mig-ga-dib-ba ngó, Mahimu Béga Thamanda Bádzá,	Year of religion	A. D.	Lignod V —ngier	noitaloH ne dono to tial gai	Remarks.
Wimala, Katha Kum-má, Mahimu Arinda Rádzá, Mahimu Arinda Rádzá, Geinda Rádzá, Gist-taa-wi-ra, Kara-wi-ka Rádzá, Tsan-da-la Rádzá, At-ta-thá Rádzá, At-ta-thá Rádzá, Mahimu Mig-ga-dib-ba ngé, Mahimu Bigga Thamanda Rádzá,	1116	573	13	:	Came from Thattun to build the city of Pegu.
Kathé Kun-má, Mahinu Arinda Rádzá, Mahinu Arinda Rádzá, Geinda Rádzá, Mahinu Mig-ga dib-ba Rédzá, Marinu Mig-ga dib-ba Rédzá, Kara-wi-ka Rádzá, Tsan-da-la Rádzá, At-ta-thá Rádzá, At-ta-thá Rádzá, Mahinu Mig-ga-dib-ba ngé, Mahinu Egga Thamanda Bádzá, U-ba-ma-la Rádzá,	:	555	۱~	Brother.	
Mahimu Arinda Rádzá, Mahimu Arinda Rádzá, Geinda Bádzá, Mahipu Mig-ga dib-ba Bádzá, Gits-tsa-wi-ya, Gare-wi-ka Rádzá, Tsan-da-la Bádzá, At-ta-thá Rádzá, Anuma Bádzá, Mahimu Miy-ga-dib-ba ngé, Mahimu Bígga Thamanda Bádzá, Uba-ma-la Bádzá,	:	593	2	Nephew.	
Mahintha Rádzá, Geinda Rádzá, Mahintha Rádzá, Mahintu Mig-ga dib-ba Rádzá, Gits-tsa-wi-ya, Grar-wi-ka Rádzá, Tsan-da-la Rádzá, At-ta-thá Rádzá, Anuma Rádzá, Mahinu Mig-ga-dib-ba ngó, Mahinu Bigga Thamanda Kádzá, U-ba-ma-la Rádzá,	:	669	-	Son.	
Geinda Kádzá, Mahirun Mig-ga dib-ba Rádzá, Gits-tas wi-ya. Kara-wi-ka Rádzá, Tsan-da-la Rádzá, At-ta-thá Rádzá, Atuma Rádzá, Mahimu Mig-ga-dib-ba ngé, Mahimu Egga Thamanda Rádzá, U-ba-ma-la Rádzá,	:	909	17	Son.	
Mahimu Mig-ga dib-ba Rédzá, Gars-ta-vi-ya, Tsan-da-la Radzá, At-ta-thá Rádzá, At-ta-thá Rádzá, Mahimu Mig-ga-dib-ba ngé, Mahimu Egya Thamanda Rádzá,	:	623	12	Brother.	
Gits. tsa.w.i.vs., Gars-wi-ka Rádzá, Tsan-da-la Rádzá, At. ta.thá Rádzá, Anuma Rádzá, Mahimu Miy-ga-dib-ba ngć, Mahimu Egga Thamanda Kádzá,	:	635	12	Son.	
Kara-wi-ka Bádzá, Tasn-da-la Bádzá, At-ta-thá Bádzá, Anuma Bádzá, Mahimu Mig-ga-dib-ba ngé, Mahimu Egga Thamanda Bádzá,	:	650	2	Son.	
Tsan-da-tha Bádzá, At-ta-thá Rádzá, Anuma Bádzá, Mahimu Mis-ga-dib-ba ngé, Mahimu Egga Thamanda Bádzá,	:	099	12	Son.	
At-ta-thá Rádzá, Anuma Bádzá, Mahimu Mig-ga-dib-ba ngé, Mahimu Egya Ihamanda Bádzá, Uba-ma-la Bádzá,	:	673	13	:	Relationship not stated,
Antuna Rádza, Mahimu Mig-ge-dib-ba ngé, Mahimu Egge Thamanda Bádzá, Uba-ma-ia Bádzá,	:	689	15	:	Ditto ditto.
Mahimu Mig-ga-dib-ba ngé, Mahimu Egga Thamanda Rédzá, Uba-ma-la Rédzá,	:	3	얼	Son.	
Mahimu Egga Thamanda Bádzá, Uba-ma-la Rádzá,	:	713	10	:	Usurper,
Uba-ma-la Rádza,	:	733	12	Brother.	•
	:	734	12	Son.	
4	:	246	15	:	Relationship not stated.
17. Thamin Tik-tha, Titha, or Tissa Rádzá,	:	191	8	Son.	From this time a blank of about five hundred
					years occurs in the annals of Pegu, during

tered. The two lest kings in this list probably represent two periods, the religious secondancy, or religious saties, of Brahmanists and Budhists, extending over about three hundred years. The close of Tiths's reign would then synchronise with the conquest of Pegu and Tha-htun by Ansurahtá about A. D. 1050, when Pegu became subject to Burms for about two hundred and thirty years.

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Postscript to Bábu RA'JENDRALA'LA MITRA'S Paper on Spirituous. Drinks in Ancient India.

It has been stated on page 7, that a "fatted calf" was once slaughtered for the entertainment of Ráma, but no notice has been met with of his having been offered any liquor. I find, however, that he was not averse to drinking. The following extract from the last book of the Rámáyana shows that he and his exemplary wife, Sítá, were as much given to drinking as other people of their time. The passage runs thus: 'Embracing Sítá with both his hands, Kákutstha (Ráma) made her drink pure Maireya wine, even as Indra makes Sachí partake of nectar. Servants quickly served flesh-meat variously cooked, and fruits of different kinds for the use of Ráma. Hosts of Apsaras, proficient in singing and dancing, and accomplished and handsome damsels, exhilarated with wine, danced and sang for the entertainment of Ráma and Sítá." It is said that it was the usual every-day practice of Ráma, to devote his evenings to this feasting and musical entertainment as a fitting sequel to his onerous regal duties of the forenoon.

* शीतामादाय बाक्तभ्यां सधु मैरेयवां ग्राचि । पाययामास काकुरस्यः सचीमिन्द्रा यथास्तां ॥ ११ ॥ मांसानि च सुस्ट्यांन विविधानि फलानि च । रामस्याभ्यवद्यारार्थे किङ्करास् केमा दरन् ॥ ५१ ॥ स्प्सरामसस्युगस दत्यमोनिष्मारदाः । द्विकाद्यवत्यस्य स्वियः पानवग्रं मताः ॥ ११ ॥ स्वाद्यसम्बर्गमस्य सीताया द्विवर्दनाः ।

On page 11 the word "reference" at the end of line 1 should be read "references," and "won over over" at the beginning of line 28, should be "won over." On page 13, "especially" at the beginning of line 14, should be "especial."

Essays in aid of a Comparative Grammar of the Gaurian Languages.—By
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(Continued from Journal for 1872, Pt. I, p. 174.)

Essay IV.

On the Inflexional base.

In the third essay I attempted to collect all the facts and phenomena presented by the various Gaurian languages in regard to their inflexional base. These facts were analysed and some general principles deduced from them. Two of these general principles require a more special consideration; and this will be the subject of the present essay. It has been shown in the 3rd essay, that the inflexional base may (under certain circumstances) assume a two-fold form; viz. a direct form and an oblique form. One of the two general principles is closely connected with the direct form, the other with the oblique form.

One result of the previous enquiry has been to show that the inflexional bases of the Gaurian languages are divided into two great classes according as they admit or do not admit an oblique form, and accordingly they were divided into 1., the Prákritie, and 2., the Gaurian (including Gaurian proper and Sanskritic) nouns, i. e., into those which have retained traces of the Prákrit organic declension, and those which have emancipated themselves of it altogether. This conclusion, however, was mainly dependent upon the truth of the identity of the oblique form with the organic genitive of the Prákrit. This principle I shall try to establish now.

Another result of the previous enquiry has been to show that while some inflexional bases retain in their direct form the original Prakrit termination in, others reduce it to or . This difference was explained by the theory that the former are derived from a particular Prakrit base ending in in (or in, while the latter are derived from the general base in . The truth of this principle will be the second point I shall endeavour to establish. But the facts upon which the proof of both, this and the other principle, depends, are so closely intertwined, that it will not be possible to keep both enquiries altogether distinct.

It is a well known fact, that in Sanskrit the genitive is not uncommonly substituted for the dative, though it possesses an organic dative; (cf. Pániní 2, 3.5., M. Williams's Sanskrit Grammar §, 816, A. p. 353). In Prákrit this rule has become absolute (see Cowell's Prákrit Prakása VI. 64.); and necessarily so; for it has lost the organic dative altogether; and not possessing one, it is obliged either to paraphrase it (by postpositions, e. g.,

प्रति, जते, अर्थे, etc.), or to substitute (according to the precedent of Sanskrit) the genitive. The latter is on the whole the more common course.* The Gaurian languages which have received their grammatical system from the Prákrit (or, at all events, not from the Sanskrit), it is manifest, cannot possess an organic dative; and, it is more than probable, a priori, that what passes in them for the dative is (according to the precedent of Prákrit) either a paraphrase of the dative or a substituted (organic) genitive. The former course, viz. to paraphrase the dative by postpositions, as is well known, has become the almost universal rule in the Gaurian. † The only exception (barring isolated instances in other languages) is in the Maráthí. This language possesses by the side of the ordinary paraphrastic datives (formed with the postpositions ला, प्रत, जवल, करितां, etc., cf. Manual, pp. 17, 18,) a form of the dative ending in which has all the appearance of being an organio case-form; e. g., dative of देव God is देवास (besides देवासा, etc.); of कवि poet it is कवीस (besides कवीला, etc.); of गर it is गरुस (besides मक्सा, etc.). This dative in च is generally admitted (cf. Manual, pp. 132, 133), and can easily be shown to be nothing but the organic genitive of the Prakrit. For the genitive of देव, कवि and गर in Prakrit is देवसा, कविसा, गरस (cf. Prák. Prak. V. 8, 15). Now I have already explained in the 2nd Essay that in the later Prakrit and in Gaurian, one of two similar compounded consonants is elided and the preceding vowel lengthened (see Prak. Prak. III, 58.). Accordingly the genitive of the pronoun on (base on) in Prakrit is masc. जस or जास, fem. जसा or जामे (or जाए); of the fem. base जि the gen. is जिसा or जोचे (or जोए); see Prák. Prak. VI. 6, 6.‡ According to the

Examples from the Sakuntalá:

का तुमं विशिष्ट्यस्य दिश्यवस्य वा ॥ i. e.

Skr. का लं विवश्याय राज्याय या॥

Or. चमुजावाहि को उडकामकस्म ॥ i. e. क्रमजावीहि न उडजामनाव ॥

From the Uttara Rámacharita:

चमा तपाधकाचं चमा रङ्ख्यहेच्हाचं॥ i. e.

Skr. नमः तयोधनेभ्यः नमा रधुकुखदेवताभ्यः॥

Or. चिचदरं सम सचाराचे। कृविसादि ॥ i. e.

Skr. चिवतरं सद्यं सदाराजः केरियति॥

† The regular process of glottic development form Sanskrit to Gaurian is here, worth noting; the dative is expressed in the

Sanskrit by the dative or genitive;

Prakrit by the — genitive, or paraphrase;

Gaurian by the _____ paraphrase.

‡ The same is the case with the Magadhi Prakrit genitive in wit; e.g., Skr. प्रका is in M. Prak. पृक्षित्राच. Here we is the modification of an original w, so that पृक्षित्राच stands for पृक्षित्राच and this for पृक्षित्राच, just as देवाच for देवस्स which in M. Prak. would be देवाच (cf. Pr. Prak. XI, 12.)

analogy of the pronominal forms जाए for जसा, जोचे for जिसा, the Prakrit genitives देवसा, कविसा, ग्वसा, etc., become in the Gaurian देवास, कवीस, ग्रस. etc., i. e., the forms which we see in the Maráthí. The original genitive character of the Marathi dative in T is further proved by the dative formed by means of the so-called postposition चाडी: e. g., देव has a dative देगसाठी besides देवास or देवा सा; or कवि has कवीसाठी beside कवीस or बनीला; ग्र has गुरुसाठी beside गुरुस and ग्रुला. These forms (as देवासाठी कवीचाठी, गरूचाठी, etc.,) have always been derived thus; देवा (base) + साठी (postposition), बनी + साठी, गरू + साठी under the mistaken notion, that as देवा, कवी, गुरू, etc. are the bases in all the other cases (e. g., instr. देवा+में, dative देवा + ज्ञा, abl. देवा + इन, etc.), the same base must be contained also in the forms देवासाठी, etc. But it has never been shown what the meaning and derivation of the word wish might be. The truth is, that साठी is no word at all; and that the forms देवासाठी, etc., have been wrongly divided. They ought to be separated thus; देवास (base) and चढी postposition, कवीस + चढी, गरुस + चढी, etc. The postposition चढी is the Prakrit and Gaurian equivalent of the Sanskrit wi which, however, in the (faurian may also be modified to आशी and hence the Marathi has beside देवास + चढी also देवा + चथी (compare Skr. स्थाने which becomes in Mar. and Beng. ठाई, in Hindi and Panj. ताई). Hence देवासाठी, i. e. देवास चर्ती) stands for Skr. देनस्य चर्च or Prak. देवस्य चर्गमा ; again कवीर चर्टी is = Prik. विवस चर्टास = Skr. विवर चर्च ; again गुरुष चटी = Prik. गुरुस इडिसा, 5kr. गरार वर्षे.

So far then it is plain that the Marathi dative ending in wis in reality the organic genitive of the Prákrit.* Now in old Marathi poetry another dative form has been preserved which ends in wi, e. g., and God, dative two (see Manual, p. 138). There can be no doubt that this form in wi is but a further modification or corruption of the more original and more perfect form in w; that, e. g., and is a curtailment of another. It may have arisen thus; in the Gaurian a final short vowel is not pronounced, so that the

* In the oldest Hindí of Chand Bardáí instances of this organic genitive in **g, which in the modern Maráthí only occurs in the sense of the dative, are still found with their original Gen. sense; c. g.,

तास राज समोपं। Or. रति करन क्रीसनस्य राज यास।
रेदों नव विद्या जवारं॥ न न संस धोर न न सुर्व तास॥
i. e. Skr. तस्य राज्यः समोपे etc. Skr. निद्यं सन्य ॥ etc.
Sasivrittá Kathá XXV. 16. Ibid. XXV. 86.

Or. सेतनबंस जहन वपति।

देनजिए जिस जीस ॥

रच सु तथां निसि दीच पर ॥

Skr. देनजिरिए यसे। यस etc. Skr. तस उद्दे कम्या चनेक मुख्यती etc.

Thid. XXV. 15.

Ibid. XXV. 16.

consonant which precedes it, is virtually the final of the word; now most probably the consonant wo of the dative first changed to was a change, which is supported by the Magadhi Prakrit genitive in way, see note on page 60 and Prak. Prak. XI. 12,), and then the was becoming the virtual final sound of the word was dropped; thus was become first water (or virtually water) and finally water. Any one by pronouncing both water and water, may see how easily one passes into the other. It follows thus, that the dative form in we, being merely a modification of the fuller dative form in we, is also really the organic genitive of the Prakrit.

Now this genitive form in wi which has been preserved in the dative of the old Marathi, has been lost in modern Marathi, but it is preserved in the latter as well as in the former as the inflexional base of all cases formed by post-positions, e. g. देव, "God," has old and modern dative देवास, old dative देवा, (old and modern) instr. देवा में, dative देवा ला, abl. देवा हन, genitive देवा चा. So far then it is proved, that the oblique form in चा of the inflexional base of Marathi nouns in wais identical with the organic genitive of the Prakrit. But further it is manifest that as the nature of the Marathi dative form in इंस and जस (e.g., कवीस, गुरुस) is identical with that of the dative form in बास (e. g., देवास), so the nature of the oblique forms in and s (of the inflexional base of Marathi nouns in and s, as कवी चा gen. of कवि, गुरू चा gen. of गुरू) must be identical with that of the oblique form in wr of the inflexional base of nouns in w; and in the same manner as the form in I arose from that in II, so the form in and I must have arisen from those in रूप and जम. It follows, therefore, that the oblique forms in f and of the inflexional base of Marathi nouns in T and T are identical with the organic genitive of the Prákrit; that is, that, e. g., the oblique form wal of the noun afa is identical with the Prak. genitive कविसा and गढ़ with ग्रस, etc.

If, as has been now shown, the oblique form of the inflexional base of all nouns in \P , \P , and \P (i. e., by far the greatest part of the whole number of nouns) is identical with the Prakrit genitives, this fact raises the presumption that the oblique form of all remaining inflexional bases will be of the same nature. We will now take the different kinds of oblique forms of inflexional bases in Marathi and afterwards in the other Gaurian languages one by one and show that that is really the case.

- a. The inflexional base of all Marathi nouns (masc. fem. and neut.) in and an and an and an and an and an and an and an and an and an are Prakrit genitives.
- b. The inflexional base of feminine nouns in , has an oblique form either in for in . Those nouns which have an oblique form in , are, as I have shown in Essay III., really feminine nouns in . They belong,

therefore, to the former class, and their oblique form in द is a Prákrit genitive. Those nouns which have an oblique form in द are, as has also been shown in Essay III, really Prákrit femine nouns in जा. The Prákrit genitive of these nouns ends in जार, which in Gaurian might become जार (the final जा being reduced to ज as in the Nom. and Acc. cases), and this, finally, is contracted by regular Sandhi (cf. Prák. Prak. IV. 1.) into द ; e. g., जीम tongue has gen. जीमें; in Prákrit it is जीमा (or जीचा — Skr. जिका, cf. Prák. Prak. I. 17, III. 51); Gen. जीमार, in Gaurian जीमर, contracted जीमें (as in Bangálí वाच + एर — वाचेर, Gen. of वाच tiger).

- c. All Marathi nouns ending in consonants (masc. fem. or neut.) are treated as ending in \P , and hence the oblique forms of their inflexional bases end either in \P or in \P or in \P , and are, therefore, Prakrit genitives formed according to the analogy of the real nouns in \P . All these nouns in consonants are either Sanskritic or foreign; but never derived from the Prakrit, as no Prakrit word may end in a consonant, see Pr. Prak. IV. 6—II.

 18. Their treatment has been explained in Essay III.
- d. The inflexional bases of Marathi nouns (mase, or fem.) in र्, ज, र, र, र, जा, जा, and neuter nouns in ज have no oblique form at all. As regards the few exceptional mase, nouns in र् and ज and neuter nouns in ज, see the next paragraph.
- e. There remain the mase nouns in T to which correspond fem. nouns in \$\frac{2}{3}\$ and the neuter nouns in \$\tilde{4}\$; the mase, nouns in \$\frac{2}{3}\$ to which correspond fem. nouns in \$\xi\$ and the neuter nouns in \$\xi\$; and the masc. nouns in to which correspond the fem. nouns in to and the neuter nouns in 5. The inflexional base of the first two kinds of nouns has an oblique form in ut (masc. and neuter) and in ut (fem.). The inflexional base of the third kind has an oblique form in at (masc. and neuter) and a (fem.). The explanation of these oblique forms is more complicated. They are, as I shall show, the organic genitives of Prakrit nouns formed by the affix (masc. and neuter,) and at (fem.). It will be necessary to dispose first of the latter question; viz. the presence in the Gaurian languages of a class of nouns which are descended from Prakrit nouns formed by the peculiar Přákrit affix & (cf. Pr. Prak. IV. 25.) Here I will only draw attention to an important coincidence. Masculine and neuter nouns in whave (as has been shown) an oblique form in T (being the corruption of the Prakrit genitive in Their corresponding fem. nouns in Thave an oblique form in \(\mathbb{T}\) (being a corruption of their Prakrit genitive in \(\mathbb{T}(\mathbb{T})\). Similarly we have here mase, and neuter oblique forms in ut and ut and their corresponding feminines in चे and चे. The conclusion may be drawn that the mase, nouns in T and and the neuter nouns in and which yield. the oblique form in w, were originally masc. and neuter nouns in wor i= Tw or Tw = Tw or Tw; and that their oblique form in w is a cor-

ruption of a Prákrit genitive in यस (=र्जस=रकस). Again, that the feminine nouns in which correspond to the masc. nouns in wand and to the neuter nouns in v and v and which yield the oblique form in v. were originally feminine nouns in TI-TAI: and that their oblique form in t is a corruption of a Prakrit genitive in ure = tare. Similarly it may be concluded that the masc. nouns in s and neuter nouns in which yield the oblique form in at, were originally masc. and neuter nouns in a or a, i. e., in an or sa = sa or sa; and that their oblique form in T is a corruption of a Prakrit Genitive in TH = THE = sau again that the feminine nouns in s which correspond to the masc, nouns in wand neuter nouns in wa, and which yield the oblique form in 3, were originally fem. nouns in 41, i. e., in 541 = 541; and that their oblique form in a is a corruption of a Prakrit genitive in are-sare. As regards the oblique form in v or vi of the inflexional base of certain nouns in the Hindí-class (faurian languages, their case is exactly like that of the last mentioned class of Maráthi words. The two classes of nouns correspond to each other in the two classes of Gaurian languages, e. g., Hindi चाडा horse, obl. चाडे, is in Marathi चाडा, obl. चाड्या. And their oblique forms must therefore have the same nature, and must admit of the same explanation; viz. that they are the organic genitive of particular Prákrit bases formed by the affix. क (i. c., ending in अक).

The evidences showing that there is in Gaurian a class of nouns, which are derived from Prákrit bases formed by means of the peculiar, pleonastic affix , are the following. In the first place, it may be remarked, that all Sanskrit words which have a base in TA (i. c., formed by the affix TA) and have passed into the Gaurian through the Prakrit, terminate in the Gaurian in बा(बा) or बा, and not in ब or ब; e, g., horse is Skr. बाटब, nom. sing. बाटकः, Prák. बाटका or बाटबा, Gaurian बाडा or बाडा :-Skr. कटकः stiff, Pr. बहादी or बहरी, Gaurian कहा or कहा :--Skr. चन्यक: the champaka tree, Prik. चंपका or चंपका, Gaurian चंपा or चंपा; - Skr. पालकः keeper, Prik. वालका, Gaurian बाला or बाला (an affix) ;- Skr. चारकः holder, Pr. धारका or बारका, Gaurian Vitt or Vitt (an affix).—There are only a small number of nouns of this kind. But on the other hand all Sanskrit nouns, the base of which ends in wonly, and which have passed into the Gaurian through the Prakrit, terminate in the Gaurian either in at (T) or in \((\sigma)\), evidently according as they did or did not assume, in their passage through Prakrit, the affix w; e. g., sweet in (Jaurian (Hindi) is both सीड and सीडा; both represent the Skr. बिह:; but Skr. बिह: may be represented in the Prak. by fart (i. e., fart) and by fart (i. e., fart); now Prak. The becomes the Gaurian alls, and Prakrit furth becomes the Gaurian कीका (कीका). Again heat is in Skr. पर्न:, and pot was, both having bases in W. In Prak, they may assume the forms went or ward and wer

or चडचा. But of the former pair the form बना became the usual one while of the latter pair घडचा was the usual one. Accordingly we find in the Gaurian heat to be बास, but pot to be बारा or बड़ा. These examples might be multiplied indefinitely.

Next, Sanskrit masculine nouns which have a base in we exhibit in the Gaurian a two-fold termination. They either end in ौ (🖏 🖜) or in 🔻 (3). But a very analogous phenomenon may be observed in Sanskrit neuter nouns in ▼, with nom. sing. in ▼₹. They exhibit in the Gaurian a twofold termination ending either in च or in चा, जं, ए, र्, ; e. g., Skr. स्टब्स् house = Gaur. घर; but Skr. शतम् done = Gaur. केंडे (Mar.) or की में or कियाँ (Br. Bh.) or की मूँ (Alw.); and Skr. मैतिकम् pearl Gaur. माती (Mar.). Sometimes both forms occur in the same word as Skr. बद्दम plantain = Gaur. केंस or केंसे, and Skr. नार्किसम cocoanut = Gaur. नारक or नारजो (Mar.). But observe the difference. The nom. sing. of those masc. nouns ends in Skr. in w; this turns in Prakrit into w; and this again, in Gaurian, is either retained unchanged in or reduced to it. All this is intelligible; from पः (= पस्) to पा to पा, there is a direct progress of phonetic corruption, consistent with the glottic laws regulating the development of younger languages from an older one. But now in the other case; the nom. sing. of neuter nouns in Skr. is wi (= wa) which remains in Prakrit v or becomes simply v; in Gaurian the Prakrit v or v is either reduced to (resp. remains) च or is raised to बेएँ, जॅ, एँ.एँ. * Now this is contrary to all principles of glottic development. By whatever other means languages may increase and reconstruct themselves; phonetically they disintegrate and decrease as they advance. The simple Prakrit termination or vican never by itself have been raised or increased to vi or vior This is utterly inconceivable, nor will any reference to the accent help us here out of the difficulty. The accent might explain the absence of phonetic disintegration, where its presence would be expected, as, e. g., that the Prakrit termination Tremains in the Gaurian, in some cases, ₹7, instead of being reduced to ₹7; (though even in this case, as I have shown in Essay III, the explanation by the help of the accent is quite inadequate); but it is quite unable to explain the presence of a phonetic increase which is contrary to glottic laws, according to which either phonetic disintegration or at least no change at all ought to have taken place. It

* E. g. Skr. स्टबं, = Prák. चरं or चर, = Gaur. चर. But Skr. खतं, = Pr. खड़ं or खडं, = Gaur. (Mar.) केखें; or Skr. खतं, = Pr. दिखं or खडं, = Gaur. (Br. B.) कियों; or Skr. नेशिकं=Prák. केशिकं=Gaur. (Mar.) नेशिकं . Or in the same word Skr. खडं = Pr. केरं or केर = Gaur. केख or केखें (Mar.) or केखा (H. Hinds); and Skr. बार् केखें, = Pr. बार्रिकं or बार्रिकं, = Gaur. (Mar.) बार्क or बार्रिकं . In this last case it is especially obvious that the same Skr. or Prák. form could not have been the immediate source of the two widely different Gaurian forms.

Pelkrishna i abno Libraria

is evident the Gaurian neuter forms in \$1, 5, \$7, \$7, must be susceptible of such an explanation as accounts for the phonetic increase without shutting out the possibility of phonetic disintegration in these same forms.

I think a clue to the right interpretation of these neuters in 🖥 (Hindí Br. Bh.), 👣 (Hindí Súra Dása), 🕏 (Hindí, Alw., and Maráthí), 💆 (Gujarátí and Naipáli); 🔻 (Maráthi); 🕇 (Maráthi) is given us by the Gaurian infinitives. Let us take, for example, the infinitive to do or doing. It is in the Low Hindí dialect of the Braj करने, of Alwar करने, of Súra Dása करना ; in Marathi करणे, in Naipali करन (or करने ?). The common opinion, I believe, is that all these forms are verbal nouns formed by the Sanskrit affix and that their original is the Sanskrit and Prakrit form This, as has been shown in the preceding paragraph, is impossible, because it contradicts the glottic laws. Their origin must be a different one. In Marathi the meaning of the infinitive is only one out of many, and that a subordinate one, of att and all words of this class. To express the infinitive it has a proper form in si, connected with, though not derived from, the Sanskrit infinitive in 7. The proximate and principal meaning of atti in Maráthi is that of the Latin gerund. But Maráthi possesses two forms of the gerund, one in a and another in a; besides at it has also the form करावें; e. g., incitement to act is करणा ची प्रेरण and करावया ची प्रेर्ण. Now if we turn to the Prakrit and Sanskrit we find the origin of these forms. We meet with two Sanskrit affixes forming gerunds, or part. fut. pass., of which latter the gerund is merely a particular usage; viz. चनीय and तव. In Prakrit these become অধীৰ or ৰাখিকা and নম্ব(see Pr. Prak. II, 17. VII, 33.). Now it can easily be shown that these affixes will account for the two alternative forms of the gerund in Marathi. The common Prakrit prose representative of the Sanskrit root a is at (see Pr. Prák. XII, 15.). Of this root we obtain with the affix will the gerund at the gerund at the gerund at the service of the service करनीय), and with the afflx तय, the form करित्य which is the more polished form (enjoined by the Pr. Prak. VII, 83.), or करतव (= Skr. कर्मक) which was probably the vulgar form of it. In either form (करितव or करतव) the medial would become elided (according to the ordinary rules of Prákrit), thus making करियम or कर्यम (the forms given by Pr. Prák. VII. 33.). Next these forms become contracted by sandle to acq, and finally one of the two w's is elided (according to the Gaurian law explained in Essay II.), and the preceding short \ lengthened; thus we obtain the form

Bopp (Comp. Grammar § 875) adopts this opinion but with much hesitation.

[†] Cowell in his Pr. Grammar, p. 68, gives from one MS. the form will or a light or If these are at all trustworthy, the analogous forms will or a real exhibit a form very nearly identical with the present Maráthí form will be said further on.

which is manifestly the base from which the Marathi acid is derived. Next take the alternative form action. The nom. sing. neuter of it is action. Vararuchi's sútra Pr. Prák. I, 18 shows that Prákrit has a tendency to shorten the vowel in such final syllables as in (= in or in), etc. The following examples are there given ; Skr. पानीयं = Pr. पाविषां : Skr. दितीयं = Pr. दुर्च; Skr. हतीयं = Pr. तर्च; Skr. चजीवं = Pr. चिच्चं, etc. We may well assume that in the vernacular Prakrit these vulgar forms, of which only a very few were admitted into the literary Prákrit, were much more general and regular; especially in the gerunds formed by the affix चनाय. Accordingly we may conclude that the nom, sing, neuter at the became कर्णियं or (with insertion of euphonic य) कर्णियं.* Finally कर्णियं (or करिणचं) becomes in Gaurian contracted to करणे. For ए is an extremely common substitute for any of the combinations द्व, द्व, द्व, या, वव, both in Prákrit and Gaurian. † E. g. the syllable v contained in all causal verbs becomes in Prakrit ए, as कारेदि or कारेद for Skr. कार्यति, etc. Again the Skr. कियत and इयत become in Prakrit केन + इक (properly कियम + इक) and एम + इक (= इयन + इक). Again in Gaurian (old Hindi) the Skr. Part. Past Act. affix इतवान, which in Prakrit becomes इच्चन्ता or इच्छा, becomes एउ; as Skr. विद्यानम्, Pr. विश्वनमा or विश्वक, Hindi कडेंच (in old Hindi of Chand Bardai कडेंब). Again in low Hindi the Braj Bhasha याका of him, याका to him, यामे in him, corresponds to the Ganwari एकर. एकी, एमे, etc. Again in Bangáli, in common conversation, a final or medial TU is contracted into T (see Forbes' Bengali Gram. App. A. 4. p. 160. Shamachurn Sircar's Bengali Gram. p. 149, note 45.); e. g., ufcur becomes धरे, करनिया becomes करने. We shall meet with some more examples of this favorite contraction in the course of this Essay. § Now the genitive of

* An example of this form we have perhaps in the following verse of Chand; कर सोडि पक्षव भाविशं॥

चक्रंबांन तो घरे डानियं ॥ Pr. Rai.

- i. c. The cutting of the finger of my hand will be the destruction of thy house, oh Chahuván. The same form we have probably in the Bangálí nouns of agency in जीवा (cf. Shamacharn's Grammar, p. 149.); a g., कर्निया a doer = Naipálí करवा = Hindí करने का or करनेवाला.
- † By analogy, को is a substitution for the combinations जन, जना, ना, ना as Braj Bháshá बाकी = Ganwárí कोकर; Bangálí पहुना in common conversation = पटी; cf. Skr. सुनको = Pr. सुनको, Gaur. कोना. But न is, as a rule, substituted by ज, as जनते for नचते; and य by ए; e. g. in old and low Hindí he is both नह and हह.
- ‡ Of the change of the termination बाज into क in Prakrit, I have found one example, in Mrichchhakati Act IV. p. 119, कुट्रेट एक्सिक विश्ववे = Skr. कुत्रवे स्तावान विश्ववः
- § Another example we have in Páli and Prákrit. In Páli the affix of the Instr.

 Abl., Dat and Gen of feminine nouns is vi (or vi). The corresponding affix in

the Prakrit base करनीय would be करवीयस. This form करणीयस, according to the process already explained, would successively change to करवीया— करवीया or करविया—करवा which last form is identical with the oblique form of the Marathi करवें.

Then as regards the low Hindi forms for the Marathi करके; viz., करने करना, करन् ; the way how they are derived from the original Skr. करणीयं or Prak. करबी is, probably, this. It does not seem probable that the sounds wi, wi, are merely modifications of v; at least I am not aware of any example of such a change of a terminal v to wo or wo or w. But we have seen on the previous page how the Prakrit form active would colloquially change into actual. Now there are many instances which prove that for the vowel T of the polished Prakrit the vulgar Prakrit dialects substituted the broader : e. g., in Marathi we have as the termination of the past part pass, the affix चन (as सुटना got loose) which stands for the Prakrit wo or to (see Pr. Prak. VII, 32); above we had the vulgar form कर्यम् for the more polished form कर्यमं.. probable that instead of actual the vulgar dialect pronounced actual or, with the euphonic य. करणयं. And finally करणश्रे would become naturally contracted to करना, of which करना or क नूं are merely dialectic variations. The first personal pronoun in the low Hindi of Braj Fi ego (Alwari and High Hindi ;) affords a very good illustration of this change of the terminal चर्च to हैं। Its equivalent in Sanskrit is चड़न which in Prákrit becomes Tor Ticf. Pr. Prik. VII, 40.). Now the form T could not have yielded the Gaurian form &; it could only have given v, just as ut house gives ut. but not str. Hence the original of to must be the other form st. and this violates no glottic law.* It may, therefore, be accepted as a law that the

Prákrit is ए; e. g., Páli कार्याय by, from, to, of a virgin, but in Prákrit कार्याए ; Páli कार्या, Prák. कहर, Páli कार्या = Prák. कहर, The Páli is here nearer to the Skr., where these forms would be respectively (genitive) कार्यायाः, नियाः, देखाः. Similarly in the causal where the syllable खरा is always contracted to ए in Prákrit, but only optionally in Páli; e. g., Skr. कार्यात = Páli कार्यात or कर्ति = Prák. कार्याद or कार्या. These and many other examples, especially the treatment of the medial consonants, prove that phonetically Páli occupies an intermediate position between Sanskrit and Prákrit.

See Dr. Mason's Páli Grammar, p. 105 and p. 61. 37.

It should be observed also, that the Prakrit form we stands for an original form we (i. e., base w + affix w). This is proved by the Magadhi Prakrit form of ego or wi (cf. Pr. Prak. ix, 9.) In Magadhi, namely, the diphthong w often stands in the place of the final syllable w; e. g., in Mrichchhakati:

भवं तुर मुखा। i. e. Skr. भवं नवा मुखं।

sound wi may change to i; and this conclusion is confirmed by the fact that the phonetic equivalent of wi, viz. wi, also changes into wi; e. g., the first pers. sing. pres. of the verb to be is in the Braj 📆, in Alwari 🕱 (also high Hindí), in Jaipúrí कूँ, in Naipálí कूँ (in Bangalí जादि). The original of these forms is the Prakrit प्रकासि (see Prak. Prak. XII, 19.), the substitute for the Sanskrit आ सा (from the root आच्छ for अस, just as गच्छ for गम, रूच्छ for इष्). The initial च of चच्चामि is dropped, (just as in च or चा for चच्च or अहमा), and the final t becomes quiescent (according to the Gaurian rule, see Essay III.) Thus we have चाम or चां (compare the Prakrit future; e. g., गिसस्ं for गिसिष्यासि). This is modified to की or कूँ; next the aspirated palatal w is reduced to the simple aspirate w; and thus we obtain w or z. The mode of this change seems to be this, that the anuswara, being the substitute of an original labial nasal π , is vocalised into the labial vowel π ; at least this seems to be indicated by such Prakrit nouns as ure (= Skr. पाद), नास, गास, (= Skr. पास) which in the Gaurian becomes पांच, नांच, মাৰ, (Hindí), or पाउँ, ৰাওঁ, মাওঁ, (Naipálí); both, in both Gaurian languages equally, are pronounced पाँ, नाँ, गा.

In order to remove all doubts as to the correctness of the identification of the ordinary Gaurian infinitives with the Sanskrit and Prakrit participles future passive formed by the affix चनीय, I will add the following, as I think, conclusive arguments.

- 1. On the theory that the Gaurian infinitives are verbal nouns formed
 - Or. रसे कसावि अपराबुद्यक्ष दुवासके गेरे ॥ i. e.
 - 8kr. रतत् ककापि चपरावतपचकारकं मेचन् ॥
 - Or. कार न चार चलाचले भवे ॥ i. e.
 - 8kr. बसा व भवति चकाचसं भवत्॥

by the affix wa, the Gujarátí infinitive, which ends in g (as atg to do, जाई to go) cannot be explained. Even if we should set aside the difficulty of deriving the termination v, v, v, etc., from the Prakrit v, and should admit that, e. g., Marathi कर्च, Hindi करना, etc., are derivable from the Prakrit aci, still there remains the Gujarati aci, which, it is manifest, can in no wise be connected with the Prakrit arti. On the other hand, on the theory that the Gaurian infinitives are identical with the (Skr. or) Prákrit part. fut. pass. the Gujaratí infinitives find a very easy explanation. The Gujarátí ata to do or and to go, etc., are evidently identical with the Marathi करावे or जावे, i. e. the Gujarati infinitives are identical with the Marathi gerund in आवे. But the Marathi gerunds in आवे are, as regards the sense, identical with the Marathi forms in चे (e. g. करावे is identical with करके. It follows that the Marathi forms in wand their equivalents in all the Gaurian languages must also be gerunds, i. e., derived from the Sanskrit, and Prákrit part. fut. pass. (or gerund, which is only a particular use of the former), formed by the affix चनीय. On this theory everything falls easily and naturally into its place. Both Sanskrit participles fut. pass., -those formed by the affix चनाय as well as those formed by the affix तव-passed through the Prakrit into Gaurian.* In the latter they were among other uses put to the use of expressing the idea of the infinitive or gerund. But gradually one or the other of those alternative forms gained the ascendancy, and it so happened, that in all Gaurian languages, with the exception of Gujariti, that participle future passive which was formed by the affix चनीय, dispossessed the other formed by the affix तव. On the contrary in Gujarátí the part. fut. pass. in तव dispossessed the other in water. Still the principle of forming the infinitive is in all Gaurian languages identical. If this be the case, one may naturally expect that all or some Gaurian languages will retain traces of an original twofold form of the infinitive, derived from the twofold form of the Sanskrit and Prakrit part, fut, pass. Such traces actually exist, as I shall show, in the principal Gaurian languages. That both forms still exist and are commonly used in Maráthí has been already mentioned; e.g., it is necessary for us to go abroad is in Marathi both चन्दास देशानरीं जावया चे बात जाणा चे पहेल ; again incitement to act is either करावया ची or करणा ची प्रेर्श (see Manual §. III. note.). As regards Hindi, while the modern High Hindi possesses only the forms in a (= a), the old and low Hindi dialects possess both forms. In the Braj Bháshá the infinitive may end both in ने। and ने। e. g.. Ráisníti p. 69. दसनद देखीं आहे यासे कहा जानवाँ है, i. e., high Hindi दसनद देखा

[•] I may take this opportunity of stating that, whenever this phrase of Sansk. forms passing through Prákrit into Gaurian, is employed, it is not meant to express a historic fact—for Prákrit is not a derivation of (what is commonly called) Sanskrit—but a phonetic fact.

भार रच में क्या जानना है; or p. 24, ताते भिन्ना जपाय करि जीवें जान नाहीं कपन त सांगियाँ ची सरियाँ समान चे (=high Hindi जीना चाग्य नहीं चै.....सांगना चीर सरना समान है). It may be remarked in confirmation of this view, that the declension of the infinitive in at is apparently defective; it occurs only in the nominative (in ना) and locative (in नि); e. g., p. 4, बैट रचना कपत की काम है (= H. Hindi बैठ रहना); p. 6. वह विद्याय करि कहनि साम्या (H. H. कडने जुजा). But in the other cases the oblique form in वे of the infinitive in बाँ is substituted for the oblique form in ने of the infinitive in बाँ; e. g., हाँ तुम ते कड़ पूडवे की चया हाँ (= H. H. पूडने की); or मेरे सन की बात काझ कोँ कडवे की नाहीँ (= H. H. कडने की नहीं). In the Marwari (form of the low Hindi), I believe, the infinitive in at * is even the only one in use; see the vocabulary appended to the "Selection of Khyáls or Marwárí plays" (Beawr Mission Press, 1866) ; c. g., षटना to open (बोलना); ताकवा to leave (त्यागना); दिरावाँ to cause to give (दिलाना); निकसना to quit (निकसना). etc.. etc.; examples are:

में हुँ वाण्डो रामगढ रो अंगरेज रो पायो। बारो माझ सूटवावालो नहीं रजपूती जाया ॥ e. g. H. H. में हुँ विनया रामगढ का अंगरेज को करिन्दा। स्मारा मास सूटनेवासा राजपूत न सेजाया ॥ Play Dangarasinha p. 4. क्रकम दीया है कंपनी समें बदल जमावा बाया।

याँ के बाँदे बाँटवाँस जी ये कूँ खड़वा जावा ॥ H. H. में चदल जमाने की चाया क्रॅतुम कूँ खड़ने की जाशोगे॥

Play, Angrez our Pathán p. 73, 75.

As regards Panjábi, I am inclined to think that what the Lúdiáná Grammar calls the indefinite participle and which is not declinable, is,

in reality, that other form of the infinitive. It terminates in which is identical with the oblique form of the Braj Bháshá infinitive in 37 .- As regards Bangáli, it possesses both forms of the infinitive, viz. in and in Tal; as art and after to do. The latter form in Tal is to be compared with the Braj Bháshá oblique form in Ta of the infinitives in Ta:

* I write the Marwari Infinitive (in 37) as well as the Braj Bhasha infinitive (in T) with a final Anunasika. The printed books that I have seen, never have it. The reason is that by the vulgar a final nasal is often very indistinctly pronounced, sometimes even altogether dropped; e. g., the local particle a is in Ganwari and other low Hindi dialects commonly pronounced only a or at. Nevertheless there is no doubt whatever, that the correct form is a or ar. For the same reason the form with the final Anunasika is the correct form of those infinitives; for only the Nom. sing, neuter of the part, fut, pass, is capable of expressing the infinitive idea, that is, the mere act of the verb, see the sutra of Panini quoted below; e. g., attal can only be a corruption of a na but not of a na as in Latin agendum may stand for agere but not agendus.

as Bang. करिया = Braj करिये or करवे. They are identical; for, as I shall show afterwards, the Bangali infinitive in TT is merely the oblique form (= Prakrit genitive sing.) of an infinitive in (1); it never occurs in the nominative (i. e. direct form); see Shama Churn Sircar's Grammar p. 149, note 40. The Bangali infinitive in TT is also almost identical with the Prakrit form of the part. fut. pass. in सव, as given in some MSS. which have, e. g., प्रसिद्ध for प्रसिद्ध the usual form. The form which is, no doubt, the form of the later Prakrit, arisen from the older form state by sandhi (or phonetic decay). The real origin of the infinitive (or gerund) in 7 has become very much obscured in modern Bangáli; though there are a few indications of it still remaining; e. g., while the final short wof the infinitive of the Ist and IIIrd classes of verbs is quiescent, that of the infinitive of the second class and the causal verbs is pronounced (as ŏ). Again while the infinitives of the former classes are declined according to the first declension, i. e., like such nouns as बाह tiger, सकान child (with quiescent च); the infinitives of the IInd class are declined according to the IIIrd declension, i. e., like such adjectives as T great, To small (with audible T), see Shama Churn Sircar's Grammar, pp. 129, 149, note 40. For example act to do (1st class) is pronounced karan, but विदास to walk (1Ind class) is pronounced begano. Again, the genitive of करण is करणेर, but that of वेदान is वेदानर. I have shown already (in Essay III) that the Bangálí nouns ending in an audible , belong to the Prákritic element, that is, that their final audible wais a contraction of the original Prakrit ending sa (sa or ss. ss). Accordingly, the final audible of the infinitive also indicates that it must be the remnant of an original Prakrit ending Tw or Tw (that is, that we and stands for प्राचित्र or परिचय). Another indication of that real origin of the infinitive or gerund in wais this, that they may optionally end in wa, instead of wa: e. g., threading may be both में श्वन and मार्थन (Ist class); burning पाइन and पाडानि (IInd class), thatching जाउन and जाउनि (IIIrd class), see Shama Churn Sircar's Grammar, p. 186. Now this form in fa is also found in the Braj Bháshá, where it is a substitute for the form in ने or ने (i. e., the oblique form of the infinitives in ना and ना); e. g., he began to speak is in the Br. Bh. कड़िन साम्या for the high Hindi कड़ने सुगा. The termination is, evidently, in both languages alike, a corruption of the Prákrit termination wit; and as it is found in the infinitives of all three classes of Bangali verbs, it indicates that the infinitives of all three classes are really the Prakrit Part. Fut. Pass. in अधीय (Skr. अवीय). Moreover these forms of the infinitive in T (as and and the Naipali infinitive form in W (as war) clearly show, how gradually the original ending whas become worn down to a simple W: for the final short T and W become according to the Gaurian law quiescent and thus like \(\) (see the explanation of this process

in Essay III); e. g., instead of the Braj Bháshá at a war we have in Naipáli भनन साजा, in Sindhí चवन सुजा. In this respect Sindhí agrees with Bangali; in both languages the termination of the original affix was become worn off altogether. Sindhí infinitives, e. g., are vent to read, wind to wake, and to do (see W. H. Wathen's Sindhi Grammar, pp. 37, 38). But it is clear that in modern Bangali, in consequence of the affix walls having become decayed to wa and the real origin of the latter being forgotten, a great confusion has arisen. For in many cases, Sanskrit verbal nouns, really formed by the affix चन (not चनीय), have been introduced into Bangali to serve as infinitives, under the mistaken idea that the Bangálí infinitives in Ta, are really such verbal nouns. A notable instance of this kind is the so-called infinitive are to do. This word are is really the Skr. verbal noun करणन. This is shown by the presence of the lingual . It is not a corruption of the Skr. करणीयम ; for in that case it would be written करन (as it is in Sindhi), as Bangáli, like Hindi, turns all lingual which it has received through the Prakrit, into dental a. This is proved by the causal करान (for Prákrit कारावणीय, for Skr. कारणीय), which ends in the audible (karáno), and therefore has retained more of its original character. I believe, therefore, that the real infinitive of the (primary) verb to do is and not att, which latter form is probably merely an emendation of Bangáli purists, prompted by a mistaken etymology, (as if it were a Sanskritic word, and identical with the Skr. TTTA). Perhaps old Bangálí MSS. (of which I have no specimen) might bear out my view. As regards Gujarátí, there also both forms of the Skr. and Prák. Part. Fut. Pass. occur. That in me we have represented by the ordinary Gujarátí infinitives in it. The other in walk, I think, we can trace in the Gujarátí verbal nouns in TIV. as Sucre collection (see Edalji's Grammar, p. 26, note 5).

2. Another argument for the identity of the Gaurian infinitive and the Sanskrit and Prakrit Part. Fut. Pass. in जीय is this, that in Hindí and Panjábí the infinitives are often used as adjectives and admit of a differentiation of gender and number; e. g., in High Hindí and Panjábí जिल्ला is masculine and neuter, and करनी is feminine: in the Braj Bháshá it is करनी masculine, करनी feminine, and करनी neuter. Thus, "to make many excuses is not good," is in Hindi करनी गानि (feminine plural) करनी 'there will be gnashing of teeth" is in Panjábí करनी करनी करनी विकास करनी (lit. to take gnashings of teeth will be); see Etherington's Hindi Grammar, §. 541, and Loodiana Gram. of Panjábí §. 156. Now the Sanskrit and Prákrit nouns in कर्म do not admit a change of gender and number in relation to another noun, because they have no adjectival force, but, are merely substantives; whereas the Part. Fut. Pass. in water adjectival and change in gender and number. It does not seem probable, nor even

possible, that the verbal nouns in sa can have changed their character so radically in Gaurian.

- 3. It is a very peculiar usage of all Gaurian languages to employ the infinitive to express command or necessity. E. g., "never go to their house" is in Hindi उन के युवा कभी न जाना (Braj Bháshá जानों or जानों), which would be in Sanskrit चमूचं स्थानं कर्षाचंद्र न यानीयन्. Again "we must all die" is इस मभी को सरना है = Skr. चलावं सर्वेषं (इसे) सर्वेषमितः In Panjábí तुभी चाजना "you must come" = Skr. युवाभिर् जाननीयम्. In Maráthí प्रचित्रित जावे "continue to write to us." (See Etherington H. Gr. §. 544, 545. Loodiana P. Gr. §. 95. Manual of Mar. Gr. §. 110, note). The only rational explanation of this usage is afforded by the theory of the identity of the Gaurian infinitive with the Sanskrit and Prakrit Part. Fut. Pass. It may be also noted that in modern Sanskrit, the proper imperative is almost as a rule substituted by the Part. Fut Pass. (in चनिय or तय).
- All the uses to which the Sanskrit Part. Fut. Pass. in water is put according to this theory in Gaurian, (e. g., to express the mere act, as infinitive), is provided for by Pánini. He has a sútra करायटा वडलम् (III, 3, 113), which is explained in the Laghu Kaumudi to mean, that the Kritya affixes, to which चनीय and तथ belong, are occasionally employed in many ways different from that enjoined by the ordinary rules (see Siddhanta Kaum. p. 300, 2nd Vol. and Laghu Kaum. No. 823, p. 284). The examples given are जानीयं पूर्ण powder for bathing (to both) = Hindí नदाने का चुचे; and दानीया विप्र: a brahman who is to be presented (with something); with which compare in Panjabí में उचे विश्विष अप दा = Hindi मैं वहां बैडने का हैं; or क्रम् होरना गसाँ दी बाबत सिम्म हां = Hindi मैं (or हीं) कसरी बाता की विषय खिलाने का है (see Loodiana Grammar, §. 95). These irregular, bahulam uses, of the Part. Fut. Pass. were, no doubt, more peculiar to the vulgar Sanskrit; and, hence, it is intelligible, how they became the regular uses in the Gaurian. Note also the commentary to the sútra तयान्यानीयरः (Panini III, 196), where the example is given रिधतयं एवनीयं ज्ञाया and this is explained भावे चात्स्रशिकम एकवचनं स्तीवलं च (Siddh. Kaum. p. 298, 2nd Vol.), i. e., when the Part. Fut. Pass. expresses the action itself (= रथनम), the singular and neuter is naturally employed. Accordingly. the Part. Fut. Pass. (in water and aw) in the sing. neuter may express the mere act of the verb. Both characteristics are found in the Gaurian (so called) infinitives. They, qua infinitives, both express the mere act of the verb, and also stand in the sing. neuter; as Hindi - ना or (ना), Maráthí - 7. Guiarátí 7. etc.
- 5. Perhaps the most serious objection which is felt at first sight against the identity of the Gaurian infinitive with the Sanskrit and Prakrit Part. Fut. Pass. is this, that it involves a change from the Pass. and Future to the Active and Present. But we have an exactly analogous phenomenon

in Latin. The Latin Part. Fut. Pass. in andus or endus may also have a passive or an active sense. When it is used passively, it may either imply futurity, in which case it is the proper Part. Fut. Pass., expressing chiefly necessity or fitness; or it may imply present time, in which case it is a verbal adjective (commonly called gerundive), expressing an enduring contemporaneous action. When it is used actively, it serves to express the oblique case of the Infinitive Present Active, and is called the Gerund. Now exactly in these three ways the Sanskrit and Prakrit Part. Fut. Pass. is used in Gaurian; e. g., in gerundial construction, there is time to write a letter, is in Latin epistolam scribendi tempus est, in Gaurian (4) at fara का काल है; or in gerundival construction, Latin, tempus est epistolae scribendae, Gaurian चिट्ठी सिखनी का कास है; or in Part. Fut. Pass. construction, you must write a letter, Latin, a vobis epistola scribenda est. तस से चिट्ठी लिखनी है (or लिखनी चाहिये). The Gaurian goes a step beyond the classic Latin in using the Part. Fut. Pass. also to express the nominative case of the infinitive; but the same usage is not unknown to the Latin of the middle ages, where the Nom. Sing. Neut. is sometimes used to express the mere act of the verb as scribendum to write = Hindí (H. H. The Latin has another parallel case in the verbal adjectives in tivus, which have generally active sense, but as regards origin are identical with the Sanskrit Part. Fut. Pass. in तथ (e. g., activus, dativus = टातव:. etc.), see Bopp's Comp. Gram. §. 902, p. 352, IIIrd Vol. Also the Páli has an analogous usage. It employs sometimes the Sansk. Part. Fut. Pass.. formed by means of the affix v, to express the mere action of the verb. e. g., देख giving = Skr. देश (of root दा), पेय drinking = Skr. पेश (of root पा), देख rejecting (of दा) ; सेख loving (of सा), त्रेख knowing (of जा); see Mason's Páli Grammar, §. 263a, p. 146, also §. 235b, p. 134.

But we must return to our original enquiry. We have now seen that the Gaurian neuter terminations \$\vec{v}\$, \$\vec{v}\$, \$\vec{v}\$, \$\vec{v}\$, \$\vec{v}\$, etc., cannot be derived from the Sanskrit neuter termination \$\vec{v}\$ or \$\vec{v}\$. We have further, by an examination of the Gaurian infinitive and gerund, seen, that their neuter terminations \$\vec{v}\$, \$\vec{v}\$, etc., are derived or contracted from the Sanskrit termination \$\vec{v}\$ and the Prákrit termination \$\vec{v}\$ or \$\vec{v}\$ or \$\vec{v}\$ or \$\vec{v}\$. This not only confirms the law of derivation stated previously (pp. 65, 66.), but also discovers the modus of the derivation of the Gaurian neuter terminations \$\vec{v}\$, \$\vec{v}\$, etc., viz., that they represent a Sanskrit or Prákrit terminal dissyllable (in the present case \$\vec{v}\$ or \$\vec{v}\$).

e If Bopp's opinion (Comp. Gram. § 809, p. 183, IIIrd Vol.) be correct, as it doubtless is, that the Latin Part. Fut. Pass. in andus is originally identical with the Prix. Part. Pres. Act. in were or weet: (Skr. in weet), the process of change in meaning is in Latin exactly the reverse from that in Gaurian. But this does not affect the argument in the text, as the principle of change is identical in both cases.

I will now proceed to illustrate this theory by the examination of a few other neuter forms in Gaurian which will lead us to the same result. In Marathi there are three irregular past participles of an identical formation, quite peculiar to these three only. They are no (of root ne to go), बेसे (of root so or कर to do), and मेसे (of root स or सर to die). I have given them in the form of the Nom. Sing. Neuter. Their corresponding masculine would be गेला or गेला, बेला or केला, मेला or मेला.* These three past participles are also irregular in Magadhi Prakrit; and their irregularity is also quite peculiar to themselves. The corresponding (Mágadhí) Prákrit forms are, namely, गर्ड, करे, सर्ड, (see Pr. Prak. XI, 15). These forms are in the nominative singular masculine; the final T being the Mágadhi substitute for the common Prákrit termination 🖭 (Pr. Prak. XI, 10.). Their corresponding neuter would be गरं, करं, सरं. These represent the Sanskrit forms गतं, सतं, सतं. Here the Sanskrit dental त् of the past participle affix 7 has become in (Migadhi) Prakrit lingual T; and this in Marathi-Gaurian has changed to This change of Skr. 7 and Prákrit w to w, however, is in Maráthi not confined to the three past participles नेस, केस, मेस, but has become universal, as got loose is सुदस्, etc.; and therefore it is not the irregularity peculiar to these three participles. The peculiar irregularity of those three participles is in Prákrit, indeed, their change of the Skr. 7 to 3; but in Marathi the peculiar irregularity is not the change of T to W, but of the first T to V; compare Magadhi Prakrit गर्ड, कर, सर्ड, with Marathi-Gaurian गेले, केले, मेले. But this peculiar Marathi change of to tis also explained by the Prakrit; for, fortunately, in regard to one of the three (viz., कहें) the change shows itself already in Prákrit. Here, namely, we meet with the past participle form किन or केल for Sanskrit कतम. For केलिक we find also केरिक or केरक. They are derived from the original past participial form as or as or as To this the peculiar Prakrit affix was added (hence were or word); then the first wais changed to we by the rule of Pr. Prak. I, 5. (hence were or केंग्रक); then the termination was is weakened to to thence after and We have now traced the origin of the Marathi form wi in its various steps. They are; 1., Skr. 57, 2., Mag. Prák 55 or 55, 3., Prák क्शक ; 4., Pr. केरक ; 5., Pr. केकिक or केशिक, 6., Mar. Gaur. (old) केशियं, 7., Mar. That is, the terminal t of the Marathi form and is not derived from the terminal i of the Prakrit form at, but from the terminal dissyllable इचं or इयं of the Prakrit form केंद्रियं or केंद्रियं. In other words, we have arrived at exactly the same result as that of the previous examination of the infinitives. But to this another result must now be added; viz., that the

^{*} The mase, forms in \$\)\tag{\gamma} here and wherever else mentioned in these essays, are old Mar\(\alpha\)fif.

terminal dissyllable vi, to which nothing corresponding exists in Sanskrit, is owing to the addition of the Prikrit affix w.

Now by an exactly analogous process we may derive from the Mágadhi Prákrit forms गरं and सरं, first the intermediate Prákrit forms गरं and स्टा and next, the Maráthi forms गरं and सरं. The identity of the process of their origin is guaranteed by the identity of their peculiar irregularities.

But further, the neuter termination हैं is not only found in those three past participles (गेहें, तेहें, मेहें), but in all Maráthí past participles. It follows therefore, that their formation must be analogous to that of the other three participles; that is, that their termination हैं cannot be derived from the Sanskrit or Prákrit termination है, but from a Prákrit termination हैं or तिहं; in other words, from the base of the ordinary Prákrit past participles, increased by the peculiar Prákrit affix ह;* c. g., Mar. नारिहें killed is not derived from Prákrit नारिहें or नारिहें, but from the amplified Prákrit form नारिहें = नारिहें = नारिहें or नारिहें or नारिहें = नारिहें = नारिहें

But that is not all. The result of the present enquiry must plainly be put into the form of a much more general law; viz., whenever a Prákrit (or Sanskrit) neuter noun, be it a participle or a substantive or an adjective, has a terminable monosyllable w, but shows the termination & in its stead in Maráthi; this Marathi termination & cannot be derived from the Prákrit terminal monosyllable vi, but must be derived from a Prákrit terminal dissyllable अयं or द्वं (for अवं or दकं), obtained by adding the Prákrit affix a to the Prákrit base in a. No other Prákrit affix can here come in consideration (for effecting that increase of the base); 1., because no other affix beside a is added without affecting the meaning; and 2. because, though in a few cases one or two other affixes are added without any meaning, (e. g., Skr. विद्युत lightning is in Prak. विद्यु or विद्युत्ती; Skr. पीत yellow is in Prak. पीशं or पीश्च, see Pr. Prak. IV, 26), such addition of these affixes is confined to these isolated cases, while the addition of wis most common and may be made to any noun (Pr. Prák. IV, 25); and 8., moreover in order to account for the Gaurian terminal forms t, t, etc., the elision of the consonant of the affix is necessary; now a can be elided, but w is not elided.

The results which have been set forth so far, might have been equally well arrived at by taking the case of a Hindi past participle. E. g., it is

^{*} It is noteworthy that in the Gáthá dialect (or vulgar Sanskrit) "nouns and participles are frequently lengthened by the addition of the syllable क, as राहजादी, बचावाको, भाषशास्त्राः, स्ट्रिकाः, राहितकाः, पातिकाः, साविकाः." (Muir, Banskrit Texts, vol. II, p. 122). Mark, how often the terminal syllable क्या changes to रिक.

eaid is in the Braj Bháshá कही. This is the nom. sing. neuter; the masc. would be कही, the fem. करी. The corresponding form to कही is in Sanskrit किस and in Prákrit करियं or करियं. Now the form करियं could not yield the Hindi form कही, because the vowel द of the Prákrit form is present in the semivowel य of the Hindi form and the remaining terminal य cannot give या, according to general glottic law. But if we add the favourite Prákrit विशेष to करियं, everything is natural and easy. For करियं would be in Prákrit करिययं, and this in Hindi-Gaurian करियों or करी (just as इयं ego becomes दों).

According to this theory, then, the original of the Gaurian neuter terminations ए. इ. चा. चा. जं. जं. is the Prakrit terminal dissyllable द्वां or चयं. which, according to Gaurian law,* becomes in old Gaurian इयं or अयं or अयं If this be really the case, it might not unreasonably by expected, that traces of those original terminal forms र्यं, अयं may be found in Gaurian. Such examples I am, indeed, able to produce; and they will be a further confirmation of the truth of my theory. Only this is to be observed. The Gaurian terminal forms र्यं, चयं, चयं, are very slightly, if at all really, different from the Prakrit terminal form रूपं (for Skr. रूपं), रूपं (for Skr. इक) and इचं (for Skr. चकं). If, therefore, the Gaurian forms at all existed, they can only have existed in the earliest period of the Gaurian, when it was yet only a modified and decayed form of Prakrit. In Hindi we have no literature dating so far back. The earliest Hindi work known at present is the epic of Chand, which is already subsequent to that period; how much subsequent, it is not easy to say; but it is in Chand, that we find traces of those original Gaurian neuter terminations; only, for the reason now explained, they must not be expected to be very common.† Such examples are the following:

^{*} This Gaurian law has been repeatedly referred to in these essays, though I have never distinctly stated it. It is this; Gaurian cannot tolerate the hiatus of vowels created by the Prákrit, through ejecting the medial single mute consonants of the Sanskrit; and in order to prevent such hiatus, Gaurian either makes Sandhi of the vowels or separates them by inserting the (euphonious) semivowels u, or u. It should be noted, in order to prevent misunderstanding, that Gaurian sometimes creates hiatus of its own; these, of course, it retains. The law has only reference to hiatus, created by Prákrit, e.g., Skr. unit; becomes in Prák. unit; in Gaur.

The law has only reference to hiatus, created by Prákrit, e.g., Skr. unit; in Gaur. unit; Skr. unit; in Gaur.

The law has only reference to hiatus, created by Prákrit, in Prák. unit; in Gaur. unit; Skr. unit; in Gaur.

The law has only reference to hiatus, created by Prákrit, in Prák. unit; in Gaur. unit; Skr. uni

[†] On account of Marathi being so much more conservative of its Prákritic character, I should expect old Marathi to afford many more examples of those Gaurian neuter terminations; but unfortunately I have had no opportunity of examining any old Marathi work.

बेखि चसन चही तासयं।
चंडवां वृद्धि चायानयं॥ I, 26.
Or चननंनिनयकवंसेन। कदितं न च पूर्वयं॥
चहुवं च कृतं एवां। दिना स्नामी दिन मुशं॥ IV, 220. 230.
or कुटैं सिरंकरारयं।
कपास चीं पिजारयं॥
परीय संग सामयं।
च सुक रिष्य नामयं॥ IV, 204. 207.

फटिय वत प्रहासं। चनिसं सिजेम परिमल्यं॥ IV, 278.

An instance of the neuter in र्यं occurs, e. g., in the following verse:

कर मेडि पक्षव भौतियं।

चर्छवीन ने। घरे चीनियं। I, 26.

In the last verse मानियं and चानियं are probably contractions of मनियं and चनियं for Skr. मञ्जनीयं and चनियं in the sense of the infinitive. In the former verses चञ्चान्यं stands for चञ्चानं; पूर्वयं for पूर्वं, करार्यं for करारं पिजारं for पिजारं; सामयं for माम. And the only, and natural, way of explaining the origin of these amplified forms is by the theory that the shorter forms were increased by the addition of the Prakrit affix क; thus we should have (with the usual elision of क्) the Prakrit forms चञ्चानचं, पुचचं, करारचं, पिजारचं, सामचं, नामचं and finally these forms would change in Gaurian by the usual insertion of the euphonic च into चञ्चानगं, पूर्वंगं, etc.*

Such neuters as च्यानयं, प्रेंच, etc., prove clearly that general principle which has been stated already, that the Prákrit affix क was not only added to participles past passive, but also to substantives and adjectives; though this is a fact, which perhaps hardly needed to be particularly stated. But these neuters account very well for the Maráthí neuter adjectives and substantives in दें as चर्के high, तसे tank, etc. For the termination चयं as previously shown naturally contracts into दें.† Hence, e. g., उनके presupposes an older form उच्चे, which stands for उच्चे just as च्यानयं for च्यानं

We have now seen that the Prakrit neuter nouns (Part., Adj., Subst.) may pass into the Gaurian either in the general form of their base ending

* I may add here, once more, in explanation, that it is not to be supposed that every Gaurian neuter actually passed through these different steps of phonetic modification. The process of neuter formation, detailed here, only took place really when Gaurian first separated form Prákrit. After it had become the rule in Gaurian, that neuters must end in we or or wi, many neuters, of course, were formed which never passed through any of the steps of the process; e. g. the neuter was is formed direct form the Sanskrit wi. If it had passed really (as ideally it must be supposed to have passed) through that process, it would have been either was; or the Prákrit of wi is well.

† In Col. Vans Kennedy's Maráthi Dictionary the form wi is given for well fear.

in **पं**, in which case these neuters terminate in Gaurian in **प**; or in the particular forms of their base ending in **पपं** (amplified by the addition of the affix **प**). This termination **पपं** becomes in old Gaurian **प**ं. Instances of old Gaurian neuters in **प**ं have been adduced. In modern Gaurian the termination **प**ं is contracted to **ए**; and this neuter terminal form we have in Marathi.

But the old Gaurian termination wi is not the only form which the Prakrit termination 🖘 (= 🐃) assumes in Gaurian. The Prákrit termination चनं (or चर्च) suffers in Prakrit already a twofold deteriorating It changes sometimes into (or (a)), sometimes into (or **34**). This deterioration is found in Prákrit only in a few and isolated cases; but in Gaurian it has assumed much greater dimensions, and has affected, as we shall presently see, whole classes of nouns. It is therefore doubtlessly more appropriate to consider these phonetic modifications of the original Prákrit termination si as a Gaurian one, than as a Prákrit one. This should be noted, as it has some bearing on the question of the presence or absence of an oblique form of the Gaurian nouns which have this modified For proofs of the deterioration of the Prakrit basetermination wa into ca and wa, I must refer more especially to the examination of the Gaurian masculine and feminine nouns in and s. In the Mrichchhakati the form ara (the Prak. modification of the Sanskrit and) often alternates with aften. Again, the Sanskrit eften scorpion, itself already modified from an original form eva, becomes in Prákrit विद्य or विद्य or विद्य (cf. Pr. Prák. I, 15).* Again, the Sanskrit माहक becomes in Prákrit माजब (for मातुक cf. Prák. Prák. I, 29); that is मादक first changes to मात्रक, (by Pr. Prák. I, 27; next to मात्रक). If the Prákrit base termination in wa may change to ta or wa in the case of masc. and fem., it is plain that it may do so also in the case of neuters. In Gaurian the Prakrit neuter terminations रूपं (= रकं) and उपं (= पकं) are slightly modified; viz., in old Gaurian to दृदं and उनं, and in modern Gaurian to दे and जै, e. g., pearl is in Skr. सुन्ना in Prak. साना or सानिका. The latter has a bye-form सानिवं or सातिवं (Skr. सामिकं), and this changes in old Gaurian to मानियं, in modern Gaurian (Marathi) to मानी. That this is the true derivation of the final of मानी is proved by such neuter nouns as पार्की water, सीरी pepper, सार्की butter, दशी curds. For पानी represents an old form पार्वियं, a Prakrit form पार्वियं, and Skr. पार्वीयस: सिरी represents an old Gaurian सिर्दि, a Prákrit सिर्दि, and Skr. सिर्दिस; सोदी an old Gaurian सावियं, Prak. बोबीयं or बादियं, and a Sanskrit नवनीतस; दशी an old

But the unmodified form Takes or Takes must have existed also in Prákrit. This is proved by the Naipálí which has faces for scorpion, (see St. Luke zi. 12, z. 19.), while the Hindí has faces and the Maráthí face.

Gaurian द्वियं, a Prák. द्वियं or द्विकं. and Sanskrit द्वि. Again touch is in Sanskrit स्वर्ण, in Prákrit एंस or पंस्क; the latter has a bye-form पंस्क or पंस्कं, (with the meaning branch of a river) which changes in old Gaurian to पंस्कं and in modern Gaurian (Maráthí) to पँसे. This derivation is proved by such neuter nouns as पँसे tear which stands for a Prákrit पंस्कं or पंस्कं and a Sanskrit स्त्रु; and क्रू yoke which stands for Prákrit क्या and Sanskrit क्या.*

We have how discovered the derivation of all the Gaurian neuter terminal forms; viz.

The neuter terminal forms, of which the derivations are here given, are the terminations of the direct forms of the Gaurian neuter nouns. We will now proceed to examine the oblique forms of the same nouns. And it will be seen that this examination will confirm the result already attained.

We will first take the Maráthi neuter nouns in जै. These are divided into three classes; (1) those which have no oblique form at all, as राजान a kind of vegetable; (2) those which have an oblique form in जा, (i. e., substitute जा for जै), as तह pony, oblique form तहा; (3) those which have an oblique form in जा, (i. e., substitute जा for जै), as ताई ship, oblique form ताजा (or तारजा). Now if we turn back to the list of derivations of the direct forms given above, we find a twofold derivation of the direct form in ज, and it will be easily seen, that there is a close agreement between the twofold derivation of the direct form, and the three-fold formation of the

* Some other neuters of this kind are the following; ताई ship for Prakrit ताइक bye-form of ताइक and Sanskrit ताइक a raft, float; ताई bile for Prakrit ताइक, bye-form of ताइक and Sanskrit ताइक, amplified from Sanskrit ताइक; एक bile for Prak. प्रकृत bye-form of प्रकृत and Sanskrit प्रकृत . Again कुछ circumvallation for Prak. प्रकृत and Skr. कुछ्क powder for Prak. कुछूक and Sankrit कुछूक handle for Prak. कुछूक and Sanskrit कुछूक handle for Prak. कुछूक into a is noticeable and exceptional; the regular change is into a (see Pr. Pr. III, 40.), a being the regular representative of a (see Pr. Pr. III, 12). Note also that the Hindi equivalent of the Mar. के yoke is कुछूक or क, the former of which would represent a Prak. form कुछूक for (कृतक). The form कुछूक occurs in the old Hindi of Chand; e. g. in the verse.

चनसे तथां दंश्य इ नयनं ॥ Devagiri Katha v. 22.

oblique form. Namely (1), neuter nouns in which have an oblique form in T, are derived from a Prákrit base in TT (= TT); and (2) neuter nouns in क which have an oblique form in वा, are derived from a Prákrit base in st (= sa); and (3) neuter nouns in st which have no oblique form at all, are derived or rather modified from Prakrit neuter nouns in ज्यं (= ज्यं). Examples will explain this further. A neuter of the first class is पिस् cub; in Sanskrit the word is पिसः masculine, but the neuter (in diminutive or endearing sense) would be पिन्नं. The latter, in Prakrit, is पिन्नं or पिन्नकं or पिन्नकं. Again, the last of these पिन्नकं, changes in Gaurian to पिन्नो and this to fund. The latter is the present Marathi direct form of the word. Now the genitive of the Prakrit पिक्रच is पिक्रचस् or पिक्रचास or fugure. The last of these becomes in Gaurian fugure or (contracted by Gaurian law) funt, which is the present Marathi oblique form of the word. Again, पेल् boil is a neuter of the second class. The Sanskrit is पिटः masc. or fora neuter. In Prakrit the latter becomes ver, which must have had a (probably vulgar) bye-form पेड्यं; and this form पेड्यं changes in Gaurian to पेस्वं (or perhaps पेस्यं), and this to पेसे, * and this to पेस्, which last is the present Marathi form of the word. Now the genitive of the Prakrit पेडच is पेड्चस or पेडचास or पेडचास. The last of these forms becomes in Gaurian पंचाया or (contracted by Gaurian law) पेखा, which is the present Maráthí oblique form of the word. Dadoba in his Maráthí Grammar admits only this form; but the Manual apparently admits also a form पेस्वा. If this be correct, the oblique form in अवा, doubtlessly, is merely a euphonic modification of the original oblique form in 47, in order to obviate the difficulty of pronouncing a double consonant.† Again খাঁখ is a neuter of the third class. I know no Sanskrit or Prakrit etymology for this or most of the neuters of this class, though, no doubt, some of them may have such an etymology. But they all have been evidently so much phonetically modified by the Gaurian, that their origin is almost unrecognizable. And having thus a purely Gaurian form, it is no wonder, that they are subject to Gaurian law, and admit no oblique form at all; that is, they belong to the proper Gaurian element. I ought to mention, however, that Dadobá (in his Grammar, §. 198., p. 72) does not admit these neuters at all; neither is any of them found in Col. Vans Kennedy's Maráthí dictionary; and, lastly, Marathi Pandits of Benares, of whom I have enquired, do not know them. I Even according to the Manual which enumerates them on p. 29., §. 67, 7., they are only a very few (about 18 altogether); and even of these some are optionally Prákritic and admit the oblique form in बा or बा. They are the following बवालूं, उठवूं, उवालूं, बटूं, बाबूं,

[•] In Bangálí 👣 or 👣 commonly change to भू, see Forbes' Gr. pp. 160-4.

[†] The separation of a compound consonant by means of an inserted euphonic or ris rather common in Gaurian.

I I have seen, however, since that Molesworth gives them all in his dictionary.

काँकूँ, जावुँ, टाँटूँ, पचेकँ, फाँफूँ, चाँकँ, क्रॅंचूँ, * * खारूँ, * * राजाखूँ, * चंखँ, * चर्च, * कुँकू, * कुँद्ध. Those marked with two asterisks have optionally an obl. form in I, and those marked with one asterisk an obl. form in I. This latter fact is explained by the circumstance, that, as has been already noticed, the deterioration of the termination चन (or चर्च) to चन (or चर्च) took place, as it were, on the confines of the Prakrit and Gaurian, and that, therefore, the neuter nouns which exhibit this deterioration, are sometimes treated as Prákritic, sometimes as Proper Gaurian. As regards the two other classes; that which has the oblique form in \(\mathbb{q}\) (i. e., 1st class), contains all the neuter nouns in ज,* the only exceptions being those already mentioned as proper Gaurian, and the following nine nouns and boil, yoke, तारू ship, चरूँ haft, कँ scar, वस् iron ring, बार्बू sauce, फाँस branch of a river, पेल् boil, which form together with those marked with two asterisks in the list of proper Gaurian neuters (hence altogether 13) the 2nd class, i. e., that which has an oblique form in at. The paucity of the nouns of this class cannot surprise, if we consider, that the deterioration of the termination चन into उनं can only have taken place quite exceptionally.

Next, we come to the Gujaratí and Naípálí neuter nouns in 3, and the Marwari neuter nouns in T. They all have an oblique form in T. and are evidently, as regards the formation both of the direct and oblique form, identical with the first class of the Marathi neuter nouns in st. E. g., gold in Naipali is सान्; in Sanskrit it is सुवर्ण, in Prakrit सुवर्ण or सुवस्त or सुवस्त The last form सुनक्षकं becomes in Gaurian साना, and this changes to सान, and this to चान, which last is the present Gujaráti direct form of the word. Now the genitive of the Prakrit सुवस्य is सुवस्यस or सुवस्यान or सवस्यान. The last of these forms changes in Gaurian to नाम and this to चाना. which last form, with the addition, apparently, of a final nasal चाना (the meaning of which will be explained afterwards), is the present Gujarátí oblique form of the word. As another representative example, we may take the Gujarati infinitive and to do, to which the Marwari infinitive and corresponds. The derivation of these infinitives has already been explained. They are formed from the Sanskrit participle future passive in तक. The Sanskrit is कर्नेचं, in early Prakrit this is (करितव्यं or) करियमं, in later Prakrit करियं or करवं or amplified करव्यं, the last of these करव्यं changes in Gaurian to atti, which is the present Marwiri direct form of the word,

[•] To this class of nouter nouns belong all Marathi diminutives, which are neuter nouns in \$\subsection \text{or} \subsection'.

⁺ This amplified form accord admits a two-fold explanation. Either it may be formed from the form accord by the usual addition of the affix according to the second in according to the second in the

and next to acq or acq, which last is the present Gujaráti direct form Now the genitive of the Prakrit करवा is करवासा or कर्ज्यास or कर्ज्यास. The last of these changes in Gaurian to कर्ज्या and finally (contracted by Gaurian law) to acq which is the present Gujarátí and Marwari oblique form of the word. The Naipali neuter nouns in are the infinitives. While, e. g., the Gujarátí has at to do, and the Marwari करवा, the Naipali has करने.* The derivation of these infinitives has also been already explained. They are derived from the Sanskrit participle future passive in चनीय. The Sanskrit therefore is कर्जीयं; in Prakrit it is कर्नीचं or करिंगचं and (broadened) कर्गचं This last form कर्गचं changes in Gaurian to करना (or करना) which is the present direct form of the word in the Braj Bháshá, next to are which is the present Alwarí direct form of the word, and, finally, to atq, which is the present Naipali direct form of the word. Now the genitive of the Prakrit form act is करणबस्स or करणबास or करणबास. The last of these becomes in Gaurian करनेपा or, contracted by Gaurian law, करना, which is the present Naipálí oblique form of the word. +

The final nasal which appears in the oblique form of Gujarátí neuter nouns in उं is puzzling. At first sight, one might take it as an inorganic Prákrit, not only खुद्धं, but also खुद्धं and (with elision of य), खुद्धं, or खुद्धं (खुद्धं) and (broadened) खुद्धं (comp. vedic खुद्धं having gone, Prák खुद्ध्यं). In the latter case the process of development of कुद्धं is this; Skr. कुर्भ्यं, Prák. कुर्द्धं व्याप्त कुरुद्धं के कुरुद्धं कुरुद्धं कुरुद्धं के कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुरुद्धं कुर

- * In St. Luke's gospel the Naipálí infinitive is spelled without the final .nasal; thus art . This may be mere inaccuracy; or, if it is correct, we must assume that the original final nasal is dropped, as so often in modern Gaurian. This view is confirmed by the fact that traces of that Gaurian tendency of dropping the final neuter masal, appear also in Gujarátí, where, according to Edalji's Grammar, the neuter may end in as well as in c. g., gold is both an and and are.
- + This Prak. from acted becomes in Gaurian contracted into act which is the present Marathi direct form of the word.
- ‡ This final nasal, I think, should be written as an anunasika. In Hindí, at all events, all final and medial Gaurian nasals are anunasikas, but all medial (there are no final nasals of this kind) Sanskritic or Prakritic nasals are anuswaras. I am inclined to think that this rule obtains not only in Hindí, but in all Gaurian languages; it certainly does, as far as my limited acquaintance with the pronunciation of the other Gaurian languages enables me to judge. In Hindí, karenge they will do "is at a not are greatly seening is give (Skr. great), Prak. greatly; true is give (Skr. great, Pr. great);

addition for a mere euphonic purpose, or to distinguish the neuter oblique form from the (otherwise identical and indistinguishable) masculine oblique form, or to assimilate the neuter oblique form to the neuter direct form. The addition of an interganic final nasal occurs here and there in Gaurian, as e. g. in the negative particle नाडी or नडा, and in the noun संद (Skr. मुचन; Prik. मरं). The Gujarátí Grammar of the Rev. Joseph Van S. Taylor does not admit a neuter oblique form with a final nasal at all (see §. 140. 44., pp. 26-29). Even in Mr. Sh. Edalji's Grammar the forms with the final nasal seem to be allowed only as optional (see §. 91., p. 40). Under these circumstances the conclusion appears to be justified that the final nasal is inorganic, and, in fact, an incorrect addition made perhaps for some reason like those suggested above. If, however, the final nasal should be organic, the only solution—by no means satisfactory to my own mind—that I can suggest for the present is this; the Sanskrit neuter nouns in T and T insert a nasal (न or न) before the affix of the genitive; e. g., बारि water has Gen. वारिकः ; द्धि curds has Gen. द्धिनः ; ग्र heavy has Gen. ग्रकः ; मध् sweet has Gen. सध्ता In Prakrit this use, as an optional one, is extended even to the masculines in द and उ; e. g., अमी fire has Gen. अमिने। (or अधिसा), बाज wind has Gen. बाजकी or बाउस. This renders it not improbable that perhaps in later or vulgar Prakrit that use was even more extended, viz., also to neuter nouns in भ, so that, c. g., सुबन्नं gold would have not only

saint is बासाई (Skr. Pr. and बाखासी); where is क्यां Skr. बिस्यान, Pr. क्यांने); in is में or साही (Skr. सभी Pr. कड़काब्रि), etc., etc. In all these and like words, the nasal is pronounced by Natives as an anusasika, not as an anuswara. They are all proper Gaurian words. But in Prakritic words, as चंगा healthy, चुंबा long, चंटा clock, etc., and in Sanskritic words, as सन्धा evening, संयुक्त joined, etc., etc., the nasal is pronounced by Natives as an anuswara. The difference may, perhaps, be best illustrated by the French and English; language, exemple, environs are pronounced with what Pandits would call the anunásika, but language, example, environs, are pronounced with what they would call the anuswara. There is an essential difference between the two nasals. The anumisika is a more nasalization, which may be given to any sound (commonly to a vowel, but also to consonauts), and therefore a mere modification of a sound (बर्भिक्) but not a distinct sound (बर्ग) itself; while the anusware is a distinct and separate nasal sound (वर्ष). See Max Müller's Lectures on the Science of Languages, 2nd vol., p. 164. Panini 1, 1, 8, 8, 3, 23, 24. In poetry the distinction of the two nasals is clear and important; the anuswara makes the proceding vowel always long, while the anunksika has no influence on it whatever. In modern printed books, unfortunately, the distinction between the anunasika and anuswara is very rarely and incorrectly observed. Those printed by natives are in this respect generally more exact, than those edited by foreigners. In future, in these essays all modern Gaurian nasals will be represented. by the anunasika. In quotations, however, from the oldest Hindi, of Chand, I shall for the present, retain the anuswara; as there may be some uncertainty as to the date. when the old anuswara of the Prakrit was changed by the Gaurian into the more anunásika,

a Gen. सुवस्त्य, but also सुवस्त्या; and similarly सुवस्त्य a Gen. सुवस्त्रास्त्र or सुवस्त्रास्त्र or सुवस्त्रास्त्र . The latter form सुवस्त्रास्त्र might easily originate the Gaurian forms साम्यम, next सामान, finally सामा. This theory appears to receive some confirmation from the Marwari where the oblique form of the pronouns generally ends in स्वा the anuswara, e. g., his is स्वरा; it corresponds to the Hindi स्वता; and as इस is a Prakrit genitive स्सा (see Essay 2nd), so perhaps रस is a corruption of a Prakrit genitive रसा (= Sanskrit रनः).*

Next we proceed to the Marathi neuter nouns in T. Their oblique form ends in U. E. g., (43) pepper is derived from the Sanskrit facts: in Prakrit it is सिर्च; in Gaurian सिर्चि or, contracted, सिरी. genitive of the Prakrit निरिद्ध is निरिद्ध or निरिद्धां or निरिद्धां के last of these forms becomes in Gaurian मिरिया or (contracted by Gaurian law) सिद्या which is the present Marathi oblique form of the word. Again पाणी water is derived from the Sanskrit पाणीय; this becomes in Prakrit पारिकां (Pr. Pr. i, 18); and the latter changes in Gaurian to पार्थों. The genitive of the Prakrit पाणियं is पाणियस or पाणियास or पाणियास, of which the last form changes in Gaurian to unform or unun, the present Marathi oblique form of the word. Again and milk is derived from the Sanskrit at ; in Prakrit it is दिखे or दिखे or दिखे or दिखे. The last of these forms becomes in Gaurian दिख्यं, and this contracts into दर्हा. The genitive of the Prakrit दृष्टियं is दृष्टियस्स or दृष्टियास or दृष्टियास. The last of these forms changes in Gaurian to दिश्या, and is contracted into दहा, the present Marathi oblique form of the word. Again माती, pearl is in Sanskrit मुक्ता (or माकिक); in Prikrit it is साना or सानिका or (diminutive) मानिकं or सानिकं. The last of these forms becomes in Gaurian सातियं, and this contracts into साती. The genitive of the Prakrit मानिय is मानियस्स or मानियास or मानियास. The last of these changes in Gaurian to Hiffian, and is contracted to Hirar, the present Maráthí oblique form of the word.

There remain for consideration the Maráthí neuter nouns in ए and the Hindí neuter nouns in चाँ, चाँ, चाँ. To these is to be added a Naipalí class of neuter nouns which I have only met with in the oblique form ending in चा, and the direct form of which, I think, would probably end in चाँ or perhaps in चाँ. A comparison of the passages, in which the Naipali oblique form in चा occurs, shows us the following points concerning them; 1., they are (adjective) nouns of agency; e. g., St. Luke viii. 5. एक वीच चर्त्या निरुद्धा, i. e., High Hindí एक वीच वीगेवाचा निक्का; again दर चाप कर्या चार देख; i. e., H. H. दस चवपिवाच को दो; again St. Luke xxii. 21. सखाद पत्राचवाच का चात, i. e., H. H. तुम को पकर्वेवाचे का चाद; again St. Luke xxii. 20, सदा वत्रवा रतत को बचा चा चो; i. e. H. H. करे वचनेवाचे रक्त के वार्य चे; again विचायका दिन, i. e., H. H. विवास का दिन. In the two last examples the oblique form is clearly an adjective (qualifying रक्त and दिन); but in the others also it is an adjective, though put by itself and thus used substantively.

^{*} See, however, a note at the end of this essay.

Further in the first example we have it as a nominative; in the second as a dative; and in the fifth as a genitive. 2., These oblique forms belong to words which are equivalent to Hindi and Marathi infinitives or gerunds; this can be seen clearly by comparing the Hindi and Naipáli in the above examples; compare also Naipáli जनाउन्या दिन with Hindí जनने का दिन; and Naipálí करन्या की प्रेरना with Marithi कर्णा की प्रेरणा, etc. 3, These oblique forms are genitives. This may be seen from the fact that in the above examples विसाजन्या दिन and जन्माजन्या दिन the oblique forms विसाजन्या and जन्माजन्या are equivalent to the Hindi genitive विशास का, जनने का. Again सुनन्या in Naipali is = सननेवासा a hearer; the plural of it is सनगारेद, lit. hearer's multitude = सन्ना के का घेर. Here सन्या in the plural word is clearly in the genitive case. A little consideration will show, that, in fact, these oblique forms cannot be anything else but genitives. The words to which they belong are, as we have seen, infinitives, that is, verbal nouns expressing an act. On the other hand, the oblique forms themselves are, as we have also seen, adjective nouns of agency. Now the only way of turning a noun expressing an act, into a noun expressing an agent doing that act, is by putting it in the genitive case and supplying a common noun (as man) either expressed or understood. By doing this, the noun of act in the genitive case becomes equivalent to an adjective expressing the possession of the act by the supplied noun which is qualified by the adjective, e. g., द्भनमा is hearing; and the genitive दुनने का, if मन्य man be supplied, (i. e., सनने का मन्ष्य or Naipálí सनन्या मानिस), is a man of hearing, that is, व man who hears. Here सुनन का or सुनन्या is equivalent to an adjective. The word समझ need not be expressed, and the adjective may be used by itself as a substantive noun of agency.

Now if these Naipálí oblique forms in या must be genitives, they can only be Prákrit (organic) genitives, modified, of course, by Gaurian phonetic laws. It has been already shown that the Gaurian infinitives or gerunds are identical with the Sanskrit or Prákrit future participles passive. And it can be easily shown that, according to the phonetic process explained in the beginning of this essay, the Gen. Sing. of the Prákrit will assume the Naipálí oblique form in Gaurian. E. g., to hear (the dhátu) is यु; the Skr. Part. Fut Pass. of it is यवक्ष, in Prák. सुक्षीय or सुक्षिय; the Prák. Gen. is सुक्षिय or सुक्षियां or सुक्

This view of the Naipálí nouns of agency in या, is confirmed by the Bangálí, which possesses nouns of agency in याचा and रा, as वर्षणा or वार्षा doer (see Sama Churn Sirear's Grammar pp. 149., and 158.) • To the

^{*} The forms in जा and द्शे, as करा and करिश doer are probably, merely contractions of those in द्वा and ज्ञिया.

Naipili दुन्या hearer and the Hindi दुन्ने would correspond the Bangáli दुन्निया; and to the Hindi form (in Braj Bháshá) दुन्ने or दुन्नि- or (in Marwári) दुन्ना (the alternative Low Hindi forms of दुन्ने) would correspond the Bangáli दुन्निया. It is evident that the Bangáli nouns of agency in चिन्या and द्वा are derived from the two Skr. and Prák. Part. Fut. Pass. in चन्या and त्वा in the sense of the infinitive or of a noun expressing act; and that (as regards form) they are equivalent to the organic genitive of those participles, and thus canhot to signify the agent. Thus the Part. Fut. Pass. of the root चु (Prák. दुन्न) to hear is either दुन्नेष्य (Skr. त्रवर्ष्य) or दुन्यिय or दुन्या (Skr. त्रवर्ष्य) or दुन्याय

The Bangáli nouns of agency in अनिया and इवा (or इये and आ) and the Naipálí nouns of agency in या arc, then, Prákrit genitives, or, looked at from the Gaurian standpoint, oblique forms; they all require, to complete their sense of agency, the supplement of some common noun (as मन्य man). This noun is, however, suppressed and in course of time the real genitivenature of those nouns of agency was forgotten, and they came to be considered as regular original adjective or substantive nouns; * and, accordingly, to be declined as if their form were a nominative singular. Hence we meet in Naipali with a genitive सनत्या का, Dat. सनन्या जार, as if द्वनमा were the Nom. Sing. e. g., St. Luke xxii. 21.; तर देव मलाइ पकाजन्या का हात मेरा सँग मांच माथि ह, (i. e., H. H. मेरे पकड़नेवाले का हाथ, etc.); or St. Luke xix. 24. दस चवि क्रमा साद देख (i. e., H. H. दसवाशिकवासे की दो). Similarly in Bangálí the nouns of agency may be declined. In illustration of this phenomenon, I may refer to a parallel one in German. Some of the modern German surnames are the Latin genitive of original Christian names; but now they are considered and are declined as regular original nouns in the nominative case. E. g., such names as Jacobi, Georgii are really genitives to which filius "son" is to be added; Jacobi meant originally, the son of Jacob; Georgii, the son of George; and they are declined as Jacobis philosophie, the philosophy of Jacobi, as if Jacobi were a nominative. Similarly such names as Stevens are really genitives; for Stevens is properly Steven's son.

^{*} A very similar phenomenon happened in the formation of the direct form of the plural in some Gaurian languages; e. g., Naipáli जुल्लाहें hearers (lit. hearer's multitude) corresponds to Hindi जुल्लाहें जुल्लाहें, where some noun like चेर must be supplied. Thus Naipáli भेड़ाहें स्पृति of भेड़ा hungry == Hindi भूके (or complete भूके कि.). This will be fully discussed in a future essay on the inflational base of the Plural.

We must return now to the examination of the Marathi neuter nouns in and Hindi neuter nouns in at, at. The oblique form of the Marathi neuter nouns in vends in ve: that of Hindi neuters in venters ends in ए. E. g., done in Marathí is केंद्र, oblique form केसा; in old Hindí it is कियाँ or कोनाँ oblique form काये or कीने; -high is in Marathi जने, oblique form जना: in (High) Hindí जना (Braj Bháshá जना, old Hindí जना), obl. form कर ; -doing is in Marathi कर के, obl. form कर का, in Hindi (Braj Bh.) करनी, obl. form करने, etc., etc. Here we see that the Hindi terminal र always stands in the place of a Maráthí terminal v. Now if we put together this fact with the other fact, already stated, that in Gaurian the syllable of (or or eq, etc.) is often contracted into the diphthong e; and also with the fact noticed before, that the Naipáli oblique form in T corresponds to the Hindí oblique form in v, (as Naipilí was to Hindí करने); the conclusion must necessarily be drawn, that the terminal ए of the Hindí oblique form of nouns is a contraction of an original termination (and this will apply not only to the termination of the oblique form of Hindí neuter nouns, but also to that of Hindí masculine nouns in a or a: for, e.g., the Hindi masculine noun (बाह्रा or) बाह्रा horse is identical with the Marathi (बाहा or) बाहा; and the oblique form of the latter बाहा must also be identical with the oblique form of the former are; and so forth.

The next question is, what is the origin of this original termination v of the Gaurian oblique form of neuter nouns in wi, wi, w, and their corresponding masculine nouns. Here the infinitives afford us again a clue to its right interpretation. A Hindi infinitive is, e. g., and to do; we have seen, it is derived from the Prakrit active. Now active changes in the Nom. case successively into करिएक, करका or करने. In the genitive case it changes successively from activate, activate to activate करिकार, करिका, करना, करने. And thus by phonetic changes, perfectly regular, natural and easy, we arrive at the direct form in a and and and the oblique form in Tof the Hindi neuter nouns. And the conclusion we draw, is that the termination of the Gaurian oblique form is a contraction of the termination was of the Prakrit genitive; and this is the case also with all Hinds neuter nous which are not infinitives. E. g., the oblique form and of the neuter noun and done must represent a Prakrit successively into किर्यास, किर्यास, किर्या, किया, किर or किसे (with euphonic w). Perhaps at first sight there will seem to be a difficulty in this theory. In the case of the infinitive week both the direct form in and the oblique form in T were traceable to an original Prakrit base in TT: on the other hand, as regards all other Hindi neuter nouns in a or (as, e. g., (a), etc.) their direct form in a is derived from a Prakrit base in wile, if the theory be correct, the oblique form in w must be derived from a Prakrit base in TV. In other words the theory necessitates

the assumption that Prakrit bases which in the nominative case ended in the changed or deteriorated in the genitive case into To illustrate this, let us take again the case of and done. Its direct form represents a Prákrit nominative fact, which changed successively into विश्वा or विश्वा. The oblique form, as we have just seen, postulates a Prákrit genitive fascatt, that is, the Prákrit nominative face or face with a base in wa, has a genitive face with a base in Tw. Now though this change may surprise at first sight, there is really nothing irregular or extraordinary in it. It is a phenomenon which under certain phonetic circumstances regularly occurs. I have had occasion already to notice that the base termination () has a tendency to degenerate into () or () Thus we have in the Mirchchhakati करियं besides कर्याः and विषयो for दियकः, etc. † But the change has become an absolute rule in the feminine. Bases which in the masculine end in wa (ww) change always in the feminine into a base ending in (इच), and this rule obtains already in Sanskrit; e. g., Skr. masc. बाज्यः boy, but fem. बाहिका girl; Prákrit masc. बाह्यो, fem. बाहिका, etc. The reason of this change, probably, is that, as the ultimate in the feminine is heavily weighted (by changing w to w), the penultimate is lightened (by changing w to T). Now under exactly the same circumstances the same change evidently takes place in the later or vulgar Prákrit declension of bases in war. Take again the example of farear. The Nom. sing. is farear. The Gen. facate or facate or facate or facat. At this stage, I think, the change must have taken place; the form facal would correspond exactly to an original feminine form बाह्यका; and as the latter changed to बाह्यका. so the former changed to fafear, and for the same reason; because the ultimate had become I for I, the penultimate was shortened to I for I. Next किदिका or किर्या changed to किया: and this to किए or किये. This theory applies equally to Hindi masc. nouns in it or it. Take, e. g.; iti horse. It is derived from the Prakrit base area or area, which in the feminine becomes बादिका or बादिका. The Nom. Sing. of the Masc. is बादका or with, which in Gaurian is contracted into with and changed to with The Gen. Sing. of the masc. is बाउनसा or बाउनसा, which changes successively to बाडबार, बाडबार, बाडबा, बाडबा, बाडबा, which is the present Marathi oblique form, and finally to are, which is the present Hindi oblique form of the word.

There is another explanation possible of the Hindi oblique form in which is not open to the difficulty just now discussed. But it is open to

It should be noted, however, that, as explained previously, the Hindi infinitive termination of or a requires a change of the original Prakrit termination of to the state of the practically, there is no difference in this respect between Hindi infinitives and other Hindi neuter nouns.

[†] See also some more examples in the note 5 on page 105.

other difficulties; not only to one, but several, which moreover are more serious and much less capable of being surmounted. The explanation is this. The Gaurian diphthong T can be not only a contraction of T, but also of war. If we suppose the latter to be the case in the Hindi oblique form in there is no necessity of assuming a change of the Prakrit base termination we into www. In this case the oblique form in v (e.g., 144) is to be explained thus; the Prakrit genitives facate or facate change to favore to favore or favor. At this stage, as I have shown on former occasions, the word passed into Gaurian, and, according to Gaurian rule, either Sandhi must take place, or a euphonic letter must be inserted, to prevent hiatus. The question is, which of these two alternatives happens. According to the present theory we must assume that the euphonic letter य was inserted. Hence we get किया which finally changes to किए or किये. So far there is no difficulty; on the contrary it obviates the difficulty involved in the other theory of changing the base in we into one in we. But there is positive evidence to show that of the two alternative cases just now mentioned, not the one here assumed (viz., insertion of v), but the other (of Sandhi) took place in reality. In Marwari, namely, the oblique form is not किये but किया, and what this fact indicates is this, that in the form when it passed into Gaurian, not the insertion of a euphonic consonant v, but Sandhi of the hiatus-vowels (and v) took place; viz., विश्वया was contracted into विश्वा or (with euphonic य) विश्वा. Evidence of the same fact is the Naipálí and Gujarátí with their oblique form in T. which, as I have already shown, is the contraction of a terminal form e. g., Gujarátí चार्च gold, obl. form चाना; equivalent to Prákrit Nom. sing. रावस्य and Gen. sing. सवस्यस, or सवस्यास, or सवस्यास, or सवस्यास, and contracted दावा. It follows from all this that if the Prakrit base in remained unchanged in the process of transition of the Prákrit into Gaurian. the termination of the Prakrit genitive was contracted by Sandhi into . and not changed, by the insertion of a euphonic q, into war; and hence the origin of the termination was must be differently explained. And the explanation is, that there was an alternative case; in some places the Prakrit base in we remained unchanged, and gave rise to the oblique form in we. in other places the Prakrit base in was weakened to was and thus gave rise to the oblique form in wor w. E. g., the base was gold remained unchanged in Gujarátí and its genitive sequel (for seque) was contracted to दाना; while in Hindustan, it was weakened to safet, and its genitive द्वारिका was contracted to सामा or साबे.

The objection explained in the preceding remarks is only one of the reasons against the derivation of the termination with the Hinds oblique form from an original termination wit. I shall now proceed to state a few more reasons against it, in order to remove as much as possible, all doubts as to the truth of the theory, that the termination waterday, and this for the truth of the theory, that the termination waterday is and this for the truth of the theory, that the termination waterday is and this for the truth of the theory, that the termination waterday is and this for the truth of the theory, that the termination waterday is and this for the truth of the theory, that the termination waterday is a state of the truth of the theory, that the termination waterday is a state of the truth of the theory, that the termination waterday is a state of the truth of the theory, that the termination waterday is a state of the truth of the theory, that the termination waterday is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the theory is a state of the truth of the truth of the theory is a state of the truth of the tru

2. A second reason is this. To the Hindi oblique form in T the Marathi oblique form in T corresponds and both must have an identical derivation. Now though T may be explained as a contraction of THI in Hindí, this cannot be done with Maráthí पा. In Maráthí the initial consonant w of the syllable wi is always compounded with the final consonant of the base. There does not seem to be any trace that it may be separated from the final consonant of the base, and pronounced as war; e. g., the oblique form of aist horse is aist, but not aist. In the case of the oblique form in 41, the Manual admits an alternative form in 441; e. g. ताद ship, obl. form तावा or तादवा; but in the case of the oblique form in we neither the Manual, nor Dadobas's Grammar, nor any other grammar that I have consulted, admits an alternative form in say. If it had existed at all, it would surely have been mentioned by one or other of the grammars. Even the alternative form was is doubtful, seeing that it is only mentioned by the Manual; but the alternative sqr, it appears, does not exist at all. Now this fact would be very improbable on the supposition that the form in sal is the original one, out of which the other (the present) form in w arose by the suppression of the medial w. Such a suppression of a medial . indeed, is not uncommon in Gaurian; but whenever it occurs. both forms remain equally current, the original one without the suppression and the derived one with the suppression; and at all events, whatever the pronunciation may be, the spelling wherever accuracy is observed, follows the origin of the word. Thus in Hindí, though he knows is pronounced jántá it is always by correct Nágari writers spelled jánatá (i. e., जानसा, not जाना). Now neither of these is the case with the Marathi oblique form in या; it is always spelled with the v compounded with the preceding consonant, and always so pronounced. Even if we should rely on the analogy of the oblique form in ar. it would not help us out of the difficulty. For, as I have shown formerly when treating of the Marathi neuter nouns in st, the case is just the reverse with the obl. form in T. There the original form is that in T and the derived form is that in val, i. e., with the insertion of a euphonic vato prevent the necessity of pronouncing a compound consonant; such insertion being also not uncommon in Gaurian. If, therefore, the analogy of the oblique form in T proves anything, it proves the very thing demanded by my theory; viz. that the form in w is the original form; and if a form in should exist, it could only be a vulgar corruption of the form in w with inserted . Further, it should also be noted, that even if two alternative forms in an and an should exist, this fact, though it might allow the opposite theory, would in no way contradict my theory; (for the form in wi, as just shown, might be the original one); while if only one form in T exists, this fact is altogether fatal to the opposite theory, but accords entirely with my theory. It seems certain, then, that, at all events in Marathi, the termination we of the obl. form is original, and not reducible

- to a form in well. But if this is the case, the Hindi corresponding termination we must also be a contraction of an original termination we, and not well. And further it follows, that both in Maráthi and Hindi, the Prákrit base from which this oblique form in we and we is derived, must have ended in well.
- 3. In Marathi there is one exception to the rule that the initial consonant wof the obl. form termination with the final consonant of the base. It is the gerund in Tr. According to both the Manual (see § iii, III.) and Dadoba's Grammar (see §. 463.) the oblique form of these gerunds does not end (as we should expect according to the analogy of other neuter nouns in ए, as करने [obl. form करणा], उने [obl. उन्हा]) in चाबा, but in चावया: e. g., करावे to do, obl. form करावया (not करावा), जावे to go, obl. form जावशा (not जावा). Here the alternative form in बा does not exist at all. Now this exception proves the rule extremely well. It has been observed several times already that these Gaurian gerunds or infinitives in via are derived from the Skr. and Prák. Part. Fut. Pass. in and it has been shown in a previous place, that the Sanskrit termination तक may become in Prák. अवयं: thus Skr. कर्मके becomes Prák. (करियमं or) करियायं or कर्यायं. The genitive of the latter form is कर्यायस, which changes to करवयास or करवयास or करवया. Here the form passes into Gaurian which, according to its law, contracts the form, by Sandhi of the hiatus-vowel, into कराव्या; and thus we obtain the present Maráthí oblique form. Now let it be noted that here the semivowel wis not a euphonic insertion of the Gaurian, but an original, integral part of the word, taken over from the Prakrit. The case would be very different with any other neuter nouns, as e. g., Thigh, In Prakrit this neuter would be which in Gaurian would become say; the genitive of the Prakrit would be week or want or want or want, in which last form it passes into Gaurian, and now if we are to obtain the form star, we must assume that the Gaurian inserts a euphonic v. This, as we have seen, is not the case; the Gaurian, on the contrary, makes Sandhi under there circumstances; we should obtain the form ver. We see, therefore, that the reason why the oblique form of the Gerund in t differs from the oblique form of other neuters in t, is this, that the consonant t of the former is organic. while the v of the other neuters would be an inorganic euphonic insertion. But, as I have proved by examples from the Gujaráti, Naipáli and Marwari. it is contrary to the habit of Gaurian to insert q in this particular case; it prefers to make Sandhi. Hence the difference under discussion proves, that the oblique form in ur must be explained in an altogether different way, and the theory advanced by me, that it is the modified genitive form of a Prákrit base in we fulfils all the requirements of the case.
- 4. The oblique form in w is not altogether peculiar to Marathi neuter nouns in w, but it belongs also to the Marathi neuter nouns in w. New

the oblique form of the latter originated, as I have shown formerly, from the genitive of Prákrit bases in रूप; and, as there is no reason to suppose that the oblique form in चा of the neuter nouns in ए differs in nature from it, the tormer must also be derived from the genitive of Prákrit bases in रूप.

E. g., इसे curds has the oblique form दूपा, i. e. दूपिया = दूपिया

5. Moreover in Hindí, there is one instance which affords us positive evidence of the fact, that the obl. form termination v is equivalent to आ, and not to अश. The oblique form of the proximate demonstrative pronoun in the Braj Bháshá, is या; on the other hand in Ganwárí it is v. E. g., in this is in the Braj Bháshá यासे, in the Ganwárí vi; of this resp. is यासा and vav; to this यासा and vav; to this and vav; etc. There can be no doubt that the Ganwárí v is merely a contraction of the Braj Bháshá ut. This is easily confirmed by a further comparison of the Ganwárí and the Braj Bháshá. It has been already remarked that in Gaurian w is often contracted to v. u to जा, u to v, and u to v. Now the Braj Bháshá oblique form of the distant demonstrative pronoun is जा and this, in the Ganwárí, is represented by जा; e. g., Braj Bháshá has जाजी, जाजी, काली, काली कि Ganwárí जाजर, जाजी, काली. Again while the Braj Bháshá has vui here, जार्ग there; the Ganwárí has vui and vui.

There is still a point remaining for settlement concerning these neuters; viz. the Prakrit original of the final of the direct form. The Marathi final corresponds to the Hindi final of, of, or of (High Hindi of); e. g., Marathi or gold is equal to Low Hindi of or of (H. H. origin); Mar. of doing = Hindi of or of (H. H. origin); Mar. of doing = Hindi or of (H. H. origin); Mar. of doing = Hindi or of (H. H. origin), etc. The terminations of, of, there can be no doubt, are the modifications of the Prakrit terminal form of it is, therefore, prima facie probable, that the Marathi of is also a modification of the Prakrit termination of the

neuters in wi in early Gaurian has been already amply proved. But there are two circumstances, which would seem to indicate a different derivation of the Marathi final v; viz. from a Prakrit final vi, which in early Gaurian would become इयं (with insertion of euphonic य्). Those two circumstances are; 1. that the original of the termination of the Marathi gerunds in रें (or नें) is the Prakrit termination र्स, (e. g., करने doing is contracted from Prakrit करिक), and that by parity, all Marathi neuters in a are derived from Prákrit neuters in Ti. 2, that as the oblique form in Ti of these neuters in v is derived from the genitive of a Prakrit base in v; if we derive the direct form in T from the nominative Sing. of a Prákrit base in TT, all difficulty attending the derivation of the oblique form is removed. Though it must be admitted, that these reasons are of considerable force. vet I think, the reasons which decide for the other view outweigh them. These are, 1., that it equalizes the derivation of the neuter nouns which are common to both Maráthí and Hindí; while the Prákrit termination जां (old Gaurian जां) would explain easily the Gaurian neuters ending in भी, ज, as well as र, the Prakrit termination रूप would only explain the Marathi ending v., but not the Hindi ending vi or va, for which we would have to keep the Prakrit termination vi. 2., There is the Marathi neuter termination twhich, to a certainty, is contracted from the Prákrit neuter termination 📢; if the Marathi neuter termination 🕈 be also taken as a contraction of the Prakrit termination vi, there is no intelligible reason. why in some words the ending should have been contracted into sand in others again into v. On the other hand, there is a very good reason for this difference, if we suppose that originally neuter nouns ended partly in चरं, partly in रयं; and those ending in चयं contracted their final into र. while those ending in र्य contracted it into रें. E. g. चाने gold, is contracted form the Prakrit सुनक्ष्यं, old Gaurian सानगं; but दशे curds is contracted from the Prakrit दिख old Gaurian दिखा.-3., Again to anticipate a point which will be fully gone into in the next essay: to the Marathi neuters in & correspond Marathi masculines in w: now according as the Marathi neuter in v is derived from an original form in wi or wi, the masculine in wi must also be derived from an original from in चर्चा (चर्चा) or रूचा (रूथा); but the form चर्चा yields much more readily the contraction w (old Marathi w), than the form wor, the latter could in the first instance give us only the contracted from vi; and though there is perhaps no absolute difficulty in assuming a contraction of it to in (as in win to wit high), still it is not so easy and natural as the

In illustration might be adduced the High Hinds participle past positive in any, for the Braj Bháshá ones in any, as H. Hinds any, for Braj Bháshá wall. Here any may have arisen by the clision of a in any. But its origin may also have taken place in a different manner. The corresponding participles in Marathi and in any, which stands for the Shr. ending any, e. g. read is usual, the Shr. is wister, the

contraction of win to it (as in wain to win).—4., while on the theory of the Prákrit terminal form we being the original of the Maráthí terminal form we, the two objections to this theory (noticed above) can be reconciled; on the other hand, on the theory of the Prákrit termination we being the original, the three objections to this theory are incapable of being surmounted. As regards, namely, those two objections, it may be said: 1, that the ending we of the Maráthí gerunds in we (or win), though, no doubt, ultimately derived from a Prákrit termination we have well be proximately derived from a Prákrit termination we. For it has been shown already that the Prákrit Part. Fut. Pass. affix well may change to we we would be or well or well or well or well or well. And this derivation

Prak. (with the amplificative affix क) पढिद्की or पढिद्की; in the more vulgar and broad Prak. dialect it must have become पढद्या, this changed to पढड्या and finally to पडस्बा; in Gaurian it was contracted to पडस्रा or पडस्रा. We may well suppose that the affix द्व was also in Hindi sometimes broadened in चत्र. Hence Skr. कश्चित would become in Prak. कडिट्का or कडट्का. The latter form would change to a stall or asi or as which last is the High Hindi form of the word. The former form would change to कहिससी or कही। or कही। which last is the Braj Bháshá form of the word. The extreme improbability of the Prákrit termination 📢 being contracted in Gaurian first to या, next to बा or 🧃 is illustrated by the word स्विक mouse, which becomes in Gaurian स्सा or स्सी. Here the Gaurian termination of or an might be thought to be a contraction of the Sanskrit termination Ta: or Prákrit Tar. But if we turn to Prákrit, we find the following sútra in Subha Chandra's grammar, अपिष्टिशियोप्रतिवृद्धिभीतकचरिद्रायाम् (II, 47, corresponding to Hema Chandra I, 88.); that is, the first 🔻 of the words mentioned in the sútra changes to च ; hence the Skr. सचित: becomes in Prákrit सुस्चा, and this, now, changes in Gaurian to सभी or मुंचा.

* The insertion of a euphonic u, which, as has been remarked in another place, has become one of the phonetic laws of Gaurian, is not altogether unknown to the later Prákrit. Thus Hema Chandra in his Prák. grammar gives the following sútra water चन्ति: I, 180, in Subhachandra the corresp. sútra is यम्तिर: III, 5, and the commentary thereon कर्माद्कीयेऽवर्णात् परो योऽवर्णीऽविष्यते तव समुप्रयस्तरयमुतिभैवति, which means, that if a consonant which is preceded by or and is followed by or I is elided, a euphonic I is inserted; some examples given are III (for III). तित्ववरो (for तीलेकरा), रवयं (for रजतं), etc. This sutra limits the practice to a particular case. But in Gaurian there is no limitation; and there are not wanting evidences that even in later Prakrit the limitation was not strictly observed. Thus Hemachandra himself in his commentary to sútra I, 14, of his own grammar makes the following remark वज्रजाधिकारादीयत्युहतरयम्तिरपि, that is, by the rule of variety the semivowel w may be slightly pronounced, and he gives among others as an example sfirst fer Skr. sfirst. Also in the previously mentioned satra he mentions as an exception चित्रपू for Skr. पियति. In all MSS., in my possession, both of his grammar and that of Hema Chandra the suphonic w is generally inserted in the Prákrit examples; while in the MSS of Vararuchi's Prákrit Prakásha it is never met with.

is rendered almost certain by the fact, that the Hindi equivalent of the Marathi gerundial ending we is which can only have arisen from a Prakrit ending was. Thus the Marathi are corresponds to the Hindi करने or करने. Now the proximate original of the Hindi form and or and must have been a Prakrit form and; hence it is probable that it was also, in the form a two, the original of the Marathi form at it though the ultimate original of both forms (Hindi as well as Maráthí) was the Prákrit form कर्णीचं or करिंग्जं. Moreover the word पाची water, which is a contraction of the Prakrit form पाचिष or पाचीष, * shows plainly, that if the Prakrit termination works was modified to what or what, it changed its final in Gaurian according to rule into f, and not to v and that, therefore, in order to explain the change of the ultimate Prákrit form चित्रों to चर्चे in Marathí, we must assume, that first it was modified to चर्चे चण्यं and afterwards चण्यं to चण्.—2., It has been proved already that there is nothing extraordinary or irregular in a change of a Prákrit base in wi in the Nom. Sing. to a base in wi in the Gen. Sing.

The conclusion, then, which we must draw, appears to be this, that the termination ए of Maráthí neuters is in all cases of substantives (as पाने), adjectives (as पाने), and participles (as कहें), and probably in the case of gerunds (as करणे) a contraction of the old Gaurian termination पायं and the Prákrit termination पायं.

In order to complete the subject of the neuter inflexional base, I may add, that in the modern literary form of the Hindi-class Gaurian languages (excepting Gujarátí) the final anunásika of the neuter direct form of the inflexional base is always dropped. Thus in High Hindí we have acq for the Braj Bháshá करने and Alwari करने . Again compare पाणी water with Marathi पार्ची, and High Hindi पन् polatoe with Marathi पर् ; this is but the legitimate conclusion of a regular phonetic process affecting the final In Sanskrit we have final \(\mathbf{q} \); in Prákrit final \(\mathbf{q} \) is toned down to the anuswara; in Gaurian the anuswara is attenuated to the anunasika; and in modern literary Gaurian finally the anunasika is dropped. The result of this process is the disappearance of the neuter gender in the modern literary Hindí-class Gaurian languages (excepting Gujarátí); for by the dropping of the final anunásika the neuter and the masculine become identical and indistinguishable in form; and hence were also not distinguished in gender.

It was remarked above when treating of the Marathi neuters in that the formation of the final took place, as it were, on the confines or the debatable ground between Prakrit and Gaurian; and that, therefore,

[•] See Hema Chandra I, 101. Subha Chandra II, 59.

[†] Similarly the Dative post-position in High Hindi is if for Braj Bhasha if.

neuter nouns in may be considered and treated as well as Prikritic as Gaurian proper. This remark applies with equal force to neuter nouns in . In Marathi these neuter nouns in and are generally considered as Prikritic, and treated accordingly; i. e., have an blique form (as water, obl. form water, obl. form water, obl. form water, obl. form water, obl. form water, are always considered as proper Gaurian and treated accordingly, i. e., have no oblique form (as Hindi, Gujarátí, etc. water, water, potatoe remain unchanged throughout the declension).

The next essay (No. V) will be devoted to the examination of the inflexional base of the masculine and feminine nouns with reference to the proof of these two points; that the oblique form is identical with the Prakrit genitive, and that the termination in or in of the direct form (of masculine nouns) is owing to its original being the termination of a Prakrit base, formed by means of the pleonastic affix . This will also afford an occasion to examine an old Hindi oblique form in in or and the inflexional base of the pronouns.

APPENDIX.

A table exhibiting the various stages of phonetic decay of the nominal forms in the development of Gaurian from Prákrit and Sanskrit.

	02	Sanskrit.	Theoretical	Prakrit.	krit.	Gaı	Gaurian¹.
Ť	Ваве.	Nom. Sing	Base. Nom. Sing. (vulgar Skr.?)	Early.	Late or vulgar.	Old.	Modern
	· Rate	म के म	द वर्कम्	स्य ब ब	मे। ब्	(में। को (or से। बर्ट ?)	सोने B. साजा म. सानु G.
b (To the	िपण्यम् .	पिश्वकस्	funci	रिवस क	पिक्सां (ा पिक्सनं?)	flowing R. form M. form to
ni 86	# ·	, 1	माजिकम्	मामिक्	माणियां	मामियं	मिती अ. मेली म.
388	AL.	स्तमः	स्प्रमंकम्	फांसकं	मांसर	फांसव or फांसें	Site of
ī	पिटक	पिटकम्	पिटकाम	पिडचं			1 9 1 1 1 1 1 1 1 1 1 1
	b	5	or	o to	030	प्रमुख 01 प्रमुद्	
	- 1	पंटकम्	पंटकम्	पेटबं	;	7	j V
Bases in v	ŧ	द्ध	द्धिकस्	efter	والعه	द्रिक	दर्शे म. द्राम.
ai	F,	F'	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	*B.	404	ब्ह्रमं ० ब्हें	CAN WAR H.
8999	ķ.	E '	अद्रक्तम	300	100	ग्रस्ति थर मसो	NEW M.

			ous	Ge	run	id :	in 7	_			Ger		in	यण ।	4		1	
994	٥	4	बिरि				4	1				पानीय				रशैव	Base.	70
38,41	6	व्यम	मिरिचम्				4 1 1 1					पार्वीयम्	,			बरशेवन	Nom. Sing.	Sanskrit.
कुर्वन	्याक स्	1		•			कारतस्य					1					Sing. (vulgar Skr. ?)	Tueorencan
ुन जुन	(9 4.	. a	मिरियं	करबवय	Or	करिश्वयं	01 Q					पारीय				बरशेषं	Early.	Fra
994	(4	.ه .	भिरिषं	करक्षवयं	करवर्	Q.	कारम (करिव्य	,	Tababa.	or	वियक्ति वं	मारियां	1		OF.	करीक्य	vulgar.	FTBETIL.
कुवं कुवा	ज्यां (or ज्यावं?)	जुर्व or जों	मिरियं	करावयं	करवां (करववं ?)		करिवें Mr. (करिवर्व ?) करिवें B. करिवें A.		संवा (संवयः)	ا د نود	पीएयं	पासियं	विर्न (करनव १)	4044	OI.	करिक्यं)	Old.	
3. K.	ज्यां B. ज्या H.	` a '	निरीं म	करावें अ.	करवा B. करवे A. करब G.		करिवां B. करिवं A.		प न N. पोना H.	man drink.	*	पानों M. पानी H. (water)	करना म.	**	4		Modern.	Cartifold.

	मेला G. साथा M. साने H.	पिका M. पिके म.	मात्या भ.	फ्रांखा M.	ं प्रसा अ.	(4) jr
	से।बा से।ब्या	पिक्या पिक्या	मात्या	- - कांखा	पृख्या	
В. Овыдсе Form.	सेत्वबा or सेत्वबा	पिकाषा or पिकाषा	भाषिका	फांस्या or फांस्या	विक्रमा गुरुष्मा	- Chen
B. Obli	近年常年記 近年電報程 OT OT OT OT (程年簡章年記?) (我有簡單電電子)	पिक्रमास or पिक्रमाह	माणियास or माणियाद	फांस्थास or फांस्याह	पिडबाप or पेडबाड	affeand Or affeang
	पुरमंत्र स्थ (सुर्वाणिकस्य ?)	. पित्रकार	मा त्रिक स्य	स्तम्	पिटकस्य or . पेटकस्य	द्विकस
	प्रें प्रेंच प्रेंच	ति ब स्थ		41 × 41 × 41 × 41 × 41 × 41 × 41 × 41 ×	पिटकस्य or पेटकस्य	(Thai
	1.	Bases in	E.	*# #	पिटक १८ पटक	7 ai 2000

NOTES TO APPENDIX.

Note 1.—M. = Maráthí; B. = Braj Bháshá; A. = Alwar dialect; N. = Naipálí; G. = Gujarátí; Mr. = Marwárí; H. = High Hindí.

Note 2.—The Prákrit grammars allow only those forms of this gerund, which change the compound consonant winto आ (see Pr. Prák. VII, 33); as करियां or करेयां, to which Hemachandra adds also करियां and करेयां. But the Gaurian dialects seem to postulate two more Prákrit forms of that gerund; viz. such as change the comp. cons. आ into विश्व or वश्य; and such as change the connecting vowel द into आ (see my note or p. 83, 84); e. g., besides करियां also करियां के जरियां or करियां or करियां. Now since writing the present essay, I have found that my conjectures are supported by the Páli of the rock inscriptions; e. g., in the Dhauli inscription occurs the form करविय and in the ordinary Páli कात्यां or कायां besides करियां (see Dr. Muir's Skr. Texts, Vol. II., p. 113, and Dr. Mason's Páli Grammar, p. 90). This is all the more important, as, no doubt, the Páli of the inscriptions represents much more closely the spoken language than the Prákrit of the grammars, which may have sacrificed sometimes the established but irregular forms of popular usage to the uniformity and regularity of a fancied rule.

Note 3.—The forms कुंक and कुंक I have given on the analogy of two sútras in Subha Chandra's Prákrit Grammar (Adhy. I, Páda I, sútra 14. 15.): कित् पानुनाधिकस्॥ i. e., whenever the technical letter क is added, an anunásika must be pronounced; and माड यसुनाधासुखातिनुत्रककासके॥ i. e. in the (four) words yamuná, chámundá, atimuktaka, kámuka स् must be pronounced as an anunásika; e. g., अर्था, काउँची, etc. Perhaps we may assume, that in later and vulgar Prákrit the elision of consonants generally was compensated by the pronunciation of anunásika; and this conjecture might afford us another explanation of the puzzling final anunásika of the neuter oblique form in Gujaráti and Panjábí. E. g. if the elision of should be compensated by anunásika, we should have the Gen. द्वार्वका for द्वार्वका; and द्वार्वका would change to राज्या, and finally to राज्या. This explanation, perhaps, appears less forced than that given above in the text p. 85, 86.

Note 4.—In the text (see above p. 60) I have explained that the Prákrit Genitives in T. as TITUT, drop the final T, and change to TITUT. In support of this theory compare the remarks of Beames in his Comp. Gram. of the Modern Aryan languages of India p. 259., which I have received in the meanwhile. The only example given there is Skr. TITUTE which in Panjábí is TITUTE. A still more apposite evidence of my theory has since occurred to me in the Ganwari (Hindi) oblique form of the near demonstrative pronoun which is Tor TT and corresponds to the Braj

Bháshá form u or une. The original, namely, is the pronominal base which is defective in Sanskrit, but in Prákrit has a complete declension. The Gen. Sing. of the is in Prákrit they or the or the, in which, in later Prákrit, the u becomes changed to anunásika, thus the (see note 3). Finally the form the becomes in Gaurian contracted (by sandhi) to the which is Ganwári, or to une which is Braj Bháshá. At the same time it is manifest, that the alternative forms and u must be contractions of an original Prákrit form the (with apokope of the second personal pronoun in the Ganwári is an or art, in Braj Bháshá an or art. The original of these forms is the Prákrit genitive guest (nom. ari), or guite or guite or (in late Prákrit) guite or guit. Of the two last forms the former guite is contracted to art; the later guit to at. And so forth; the pronouns offer many more illustrations.

Note 5 .- The Maráthí मह boil, might be also derived from the Sanskrit which might be preferable, as the Skr. we means boil, while we does not exactly. In illustration of the change of the Skr. w to w, I may quote the word marked which according to Subha Chandra sutra II, 80. changes in Prakrit to area or area. If this derivation be correct, then is another example of the change of the termination was to was; for its proximate original will, then, be news. I may here add a few more examples of the change of the termination was to was or was in Prákrit which have occurred to me since writing the foregoing essay. They have not always been recognized as such by Prakrit grammarians. E. g., in Subha Chandra sútra washi a (II, 8. corresp. to Hema Chandra I, 44), it is said among the examples that पानाद is a modification of the Sanskrit प्रवासी; and again in his sutra जिहेनि प्रवासीची (II, 53. corresponding to Hema Chandra I, 94, 95) it is said that by the change of to the Sanskrit प्रवासी becomes in Prakrit प्रवासका. It is manifest, that the Prakrit प्रवासका or contracted प्रवास (or पातास) is not a modification of the Sanskrit प्रवासी (of the base प्रवासिन्) but of a Sanskrit form प्रवासकः Again Subha Chandra has a sútra वाइनेपाँड (II, 20, corresponding to Hema Chandra I, 50), according to which the vowel w of the affix we optionally changes to we the example given is असमस्या for Sanskrit अमेमयः ; that is, according to the Prákrit grammarian's theory the Skr. भनेमणः changes to भनामर्थे। or, with elision of the medial q, wanted. This is evidently a fanciful theory. The truth. no doubt, is that the Sanskrit base घमें सच is, by adding the affix क, amplified to परेश्व and then weakened to परेशिया; the latter form naturally yields the Prakrit form wanted (by eliding and). Again Subha Chandra has a sutra पर्वशासिक (II, 18, corresp. to Hema Chandra I, 57). according to which, if the comp. cons. w is changed to w, the inherent vowel becomes &; thus Skr. अरेब: becomes in Prakrit अयु. Now the form चन्द्र presupposes an original base चनेत्र, but there is no such base in Skr.;

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but सर्वेश would be naturally amplified to सर्वेशक, and this might very well be modified to चर्च क्र्य, which would yield a Prakrit form चर्चचा or contracted स्वाद. It should be noted, that all the words referred to here, are such in which the forms in and sa are confined to the Prakrit, while in Sanskrit they occur only in the form in wa. But there is a not inconsiderable number of Sanskrit nouns in war (i. e. w + affix w) which have, in Sanskrit itself, alternative and equivalent forms in Ta and Ja. Now considering that most of these forms in to and to occur only rarely and in late Sanskrit works, I think we are justified in concluding that, a., they are merely phonetic modifications of the original form in **(i. e., not formed)** by a separate and original Skr. affix (a or va, which is the common opinion); b., that originally they were peculiar to Prakrit, having originated by Prakrit phonetic law; and c., that they have been retransferred from Prákrit into Sanskrit (a theory regarding the relation of Prakrit and Sanskrit which admits perhaps of wider application, than is generally thought). If this view be correct, the number of those cases where a Skr. base in was has undergone in Prákrit a modification into a or a, will be very much enlarged. As to the prevalence of the addition of the affix T (resp. TT) in Prakrit, see the testimony of Dr. J. Muir in Sanskrit Texts Vol. II, p. 122, and Dr. Weber in Eragment der Bhagavatí, I. ster Theil, pp. 437, 438.

Note 6.—The Gaurian verb, पीना to drink, must be derived from the reduplicated root पिन (for पा), which, probably, was much more extensively employed in colloquial Prakrit than either in Skr. or literary Prak. The Prak. Gerund of पिन would be पिनहीं or पिनश्चिं, or (with elision of प्) पिनश्चिं, or with insertion of euphonic च (espec. mentioned by Hema Chandra I, 180, Şubha Chandra III, 5), पिनश्चिं, or (broadened) पिनश्चं. This latter form would be contracted in Gaurian regularly to पीनशं (old G.), पीने M., पीनों B., पीना H.

Note.—I withdraw, for the present, the remarks on the Skr. Past Part. Act. affix रतवान on page 67.

The following errata, chiefly broken vowel points, occur in the first three essays published in the Journal for 1872.

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" 133,	,,	15,	"	निषय	,,	निषयः
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JOURNAL

OF THE

ASIATIC SOCIETY.

Part I.-HISTORY, LITERATURE, &c.

No. II.-1873.

Note on two Coins from Kausambhi.—By The Honorable E. C. Bayley, C. S. I., C. S.

The two coins which I lay before the Society, come from the site of the ancient city of Kausambhi, situate on the river Jamuná, near Alláhábád, a full description of which will be found in Genl. Cunningham's work on the Geography of Ancient India, Vol. I, pp. 391-98, as also in his Archæological Reports from 1862 to 1865, Vol. I, p. 301.

Bábu Sivaprasad, C. S. I., the Inspector of Schools for the Banáras Division, to whom General Cunningham acknowledges his obligations for information regarding this site, some time ago sent me several coins found upon it. I told him, that though evidently containing types of much interest, they were unfortunately too imperfect for identification, but that I had no doubt, more perfect coins would yield a valuable result.

Bábu Sivaprasád has now sent me the two present coins with a few others of less interest, one of the latter is of the type which Col. Stacy termed the "Cock and Bull" type, and bears the legend 'Deva mita (sa?). This coin, however, is not from Kausambhi, but from Eastern Audh.

The first of the two coins which I am about to describe (Fig. i), is rather thin, weighing 37 035 grains, and is of a white metal which does not appear to be silver, but which I have not ventured to clean. The reverse bears a rude and faint representation of some animal, apparently the Indian buil. The obverse bears, in the field of the coin, the symbols of the coords tree on the left; in the middle a curious semicircular disk, with a sort of handle and some marks within the semicircle, more like a spade or similar agricultural instrument than anything else to which I can compare it.

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The symbol on the right appears to be identical with one often found on the strly punched silver coins so common in India, and resembles the rod of Asculapius, or rather perhaps two serpents entwined across a staff.



The legend, however, is the most remarkable part of the coin. It is quite legible, and I read it as ANTAGE, or "Maha Varunda," the last letter being a compound (as I take it) of the cerebral n = v = n and the cerebral v = v = d. The last letter may, however, be possibly v = v, in which case the word would read "varunda." In either case, the word would be "varunda," Prakrit for Várunda, for which no other meaning is given in the dictionaries, but that of "king of the serpents," of whom it was either the name or title. I am indebted to Rájá Kálikrishna for the etymology of the word, which he derives from the root v = v = v (varia), "to nourish or support," or as in some lexicons, "to protect, to surround,"—a root from which is said also to be derived the word varanda' or 'veranda' in such common use among us.

The conclusions I would draw from the use of this term are as follows,—
. whether it was used as the name of the striker of the coin, as such names
Balarám, Mahárám, Mahádeo, Srikishn, are used in our own day, or as an
invocation to the deity worshipped; in any case the use of the acknowledged
name or title of the serpent king indicates the prevalence of snake worship at
Kausambhi at a period which, from the character of the letters, I should be
inclined to place at least one century before the Christian era, possibly much
earlier.

The next coin (Fig. ii) is even yet more curious. It is of copper and thicker than one above. The weight is 60.444 grs. The reverse also apparently bears the figure of an animal, now undistinguishable; the obverse, however, is unusually clear and distinct, and from the form of the letters, I would give it a more recent date than the previous coin, but still place it not later than the first century of the Christian era.

The symbol to the left Bábu Pratápachandra Ghosh assures me is the true "svastika," that which is ordinarily so called, and which is identical with the "fylfot" or Odin's seal being properly termed Vajránkus'a.

The centre symbol is the sacred tree, and the third to the right a serpent. The legend runs plainly thus—

उच्चतसित

thaha jata mita

I have consulted Bábus Rajendralala Mitra, Pratápachandra Ghost. and Sivaprasad as to the reading of this somewhat obscure compound Admitting that "tha" might be taken as the equivalent of "tha," and that again as the Prakrit representation of "stha," Babu Rajendralala nevertheless prefers to read the legend as written, and I am disposed to agree with him so He would take the syllable "tha" as representing the little used word "tha," ड, an idol, "ha," इ, to break, and, jata, जत for जित, conquering or conqueror, with of course "mita' सित, for सिन, and would read the whole as "the friend of the conqueror of the idol breaker, or the "idol breaker conquering friend," the litter construction being one used not uncommonly at the period which I have above assigned to this coin Babu Piatapachandra Ghosh would picfer to read "stha' for "tha,' and the second letter as "pa," thus making the two first syllables "stha pa," for stha pa, which, taking "stha' in the secondary of the world, would of course enable them to be rendered as "protector of the world, ' but the second letter is, I think, too plainly "ha," so that the reading of "pa" is not admissible

Bibu Sivapias id pictus icading 'jata" as "jata, boin, quoting the parallel name of "Ajitasatiu," a suggestion which may be well worth considering, the entire thus icad might be translated as "friend of him who was boin an iconoclast." Without expressing any preference for these readings, which I give only as suggestions, I leave the further discussion of this very interesting coin to Sanskiit scholars

Accepting, however, as is, I think, all nost unavoidable, Rajendralala's version of the two first syllables, the question naturally arises as to who "the iconoclast" is, to whom they point. Genl Cunningham considers that the earlier Buddhists admitted the use of at most only symbols of the deity, and rejected all representations or worship of Buddha personally. If that be so, the "idol breaker" might well be one of the earlier Buddhist rulers or missionaries in any case the term is currous as pointing thus early to a struggle against idolatrous worship

In the next place it seems to me that this curious and somewhat ponderous combination of terms can hardly have been the actual name of any individual, but that it was more probably an assumed title, or synonym, perhaps that of some municipal functionary of Kausambhi. Babu Rájendrallala has suggested as accounting for the use of the curious word w, that it might have been employed under a custom by which the first letter of a Hindu name is often that of the asterism under which he is born, and as is the letter for Leo, the name might indicate the birth of its bearest under that asterism If, however, it was an official title, this suggestion

would not apply, unless, indeed, it might perhaps similarly indicate the commencement of office under that asterism.

Any way, the coins are both very suggestive contributions to the little-known early history of India, and Bábu Sivaprasád deserves the thanks of the Society for bringing them to light.

Rude Stone Monuments in Chutiá Nágpúr and other places.— By Col. E. T. Dalton, C. S. I., Commissioner of Chutiá Nágpúr. (With three plates.)

A passage in the address of our President published in the Proceedings for February last, reminds me that I should no longer delay in laying before the Society some extracts from my journal describing rude stone monuments in Chutiá Nágpúr. We have here the advantage of possessing both ancient and modern monuments of this type, we may find them crusted with lichens of time and belonging to a generation of whom no tradition even remains, or we may find them still moist with the tears of the mourner!

In my work on Descriptive Ethnology, I have given all the information which I possessed regarding the ceremonies and solemnities adopted by the Kolarian tribes in the disposal of their dead, but in regard to their monuments, their dolmens and monoliths, there is much more to say, especially since, after reading Fergusson's deeply interesting work on the subject, I find that so little is apparently on record regarding the rude stone monuments of Bengal.

In the cold weather of 1871, my work took me through some of the wildest parts of the Singbhúm District, and I saw many good specimens of the sepulchral and monumental stones of the Larka Kols or Hos. The former are in the village sometimes in one place or burial ground under the finest and oldest of the village trees, but sometimes the principal families have each their own collection near their houses.

The sepulchral stones consist of huge slabs covering the spot or spots where the ashes repose in earthen urns, raised a few inches from the ground by smaller stones used as pillars. In the village of Borkela, eight miles south of Chaibásá, I noticed a burial slab placed over the ashes of the grandfather of Sikur, the present deputy Manki of the Pir. Its dimensions were as follows: length, 16 feet; breadth 7 feet; and 1 foot 3 inches thick. Another over Turam, the grandfather of the Manki, length, 16 feet; breadth 7½ feet; thickness, 1 foot. This stone, an enormous slate, was carried from its site three quarters of a mile from the village, and the people devoted two months to the work, moving it inch by inch on rollers, when men could be collected for the purpose,

It is not surprising that they should take all this trouble for a man in the position of the Borkela Manki who is a chief of considerable influence and old family; but at the next halting place, Sargam Hato ('the village of the Sal'Tree'), I saw a huge stone which had been brought to the village in anticipation of the death of an old woman who was in the last stage of decrepitude. This old crone was not a pleasing object to gaze upon, and she had been for many years a burden to her family, but she had been kindly cared for, and had the gratification of knowing that a public funeral had been decreed to her, and the satisfaction of gazing on the monumental stone which had already been prepared to commemorate her virtues.

The Saranda Pir is a mass of hills forming the southern geographical division of the District of Singbhúm, and has a population, chiefly Kols, of about 700 souls. I entered the northern portion of this wild, unfrequented tract on the 1st January, 1872, and passing through it from end to end, emerged in Bonai on the 7th.

The villages of Saranda are few and far between, and the scanty population of the Munda type of Kols are in a very primitive state having no intercourse with the world beyond their own valley. In marching through the Pir to Bonai, the road continued up the valley watered by the Koina, which we traced almost to its source, and the small villages were for the most part on or near its banks. The sites were picturesque enough, and we generally found for our bath, pools shaded and rock-bound, in which Diana and her nymphs might have disported themselves. The people were at first rather shy. Many of them had never before seen a white face, but they gained confidence as we quietly advanced, and no evil fell on them in consequence of our intrusion. On one occasion, the women of a village which we passed were induced to follow us to camp, and there they sang and danced Most of the men were away clearing the road; but those we saw, and the girls, in number twenty-five, who danced for us, were of strikingly fine physique, and there was very little drapery to hide their grand proportions. The predominance of eyes, nose, and mouth of the Mongolian type was very remarkable; some of them were of very light and bright colour, one of the group from her features and complexion might have been taken for a Chinese girl. Such traits stereotyped in Saranda, seem to indicate that these Mundas have been there from a very remote antiquity without opportunities of miscegenation. Some of the young women told me they had never ventured to cross the borders of their Pir.

After the dance we remained on very good terms with the fair sex in Saranda. The young women joined the men in clearing our path through the forest, and the vigour with which they used their felling axes, the hearty, good humour with which they toiled at the work, greatly astoniahed and edified our comparatively indolent and apathetic camp followers.

There are no ruins in Saranda, no indications of its having ever been even partially inhabited by people of civilization superior to those who are now there. The Saranda Garh (i. e. fort) shewn in the map is a mere earthen wall and moat constructed round the site of a house, formerly occupied by a family who are said to have held the position of chiefs of Saranda. Within this enclosure, there is a wonderful iron kettle-drum of gigantic size. It lies bottom upwards half buried in the earth. The people of the place could not be induced to go near it, except as postulants in an attitude of prayer! The tradition is that when the chief wished to summon his people, the drum was conveyed to the summit of the highest hill, and it could thence be heard in every village in the Pir.

I give these extracts from my journal to shew that in the Saranda Kols we find a very primitive type of the race. They are, by their own account, the true autochtones of the country, and till recently, no one has ever attempted to intrude on their exclusive occupation of this mass of hills. They repudiate all traditions of migrations which neighbouring cognates accept. The country they occupy was made for them and they for the country, and how long have they been here?

The oldest looking village that I saw, was called Rongso, where my tents were pitched under some grand old tamarind trees of immense age. Close adjoining, two noble Banyan trees stretch out their long arms and great hands over a vast area of massive slabs, which cover the ashes of past generations of the villagers. The small huts in which the living dwell, are miserable structures, but the dead lie in the most solemn and impressive burial ground that I have ever beheld. I have seen no finer Banyan trees than those which here form not only the canopy of the mausoleum, but grow columns and arches separating the whole into compartments, which fill the mind with a vision or dream of aisles, transepts, and crypts,—an old abbey of the Elves or Dryads. The site, it is said, was originally taken up by one family. There are now fifteen houses and about 75 inhabitants. The deaths are at the rate of about two per cent. per annum. All who die do not attain to the dignity of a slab, and the ashes of several members of a family may be deposited under one stone; for this is the custom of the Mundas, and I found the Saranda people more Munda than Ho, that is, in customs resembling more the Kols of Chutiá Nágpúr proper, than the Singbhum members of the family. The slabs above ground considerably exceeded 300 in number, but there were more buried or nearly buried. We may assume 400 slabs, and if we give only two to a slab and make allowance for the increase which starting with one family there must have been in numbers, we have proof of great age in what we see.

But this is a pigmy burial-ground in comparison to some which I subsequently visited.

I am indebted to Mr. T. F. Peppé for having directed my attention to the great Munda burial ground of Chokahatu ('the place of mourning'), and for the photograph of this very interesting scene, which I am sending with this paper.

This village is situated between Bundú and Buranda with Tamár to the south. These are all estates in the Lohardagga District, or it would be better to say in Chutiá Nágpúr proper, called now, with two others, Pánch (five) Parganah. The majority of the population and oldest people are Mundas, and the chiefs, who are usually called Rájás, are unquestionably Mundas too, though they are now thoroughly Hinduised, and call themselves Rájpúts and Kshatriyas. There is a burial ground at Bundú, which merits attention, as a section of an understratum of graves, buried by time, is shewn where the soil has been cut away by water, and the cinerary urns are exposed, but the account of one will suffice.

The road from Bundú to Chokahatu goes east through a highly cultivated country. It crosses the Kanchi River, and on the right bank of that stream, I came unexpectedly on some very old looking ruins of stone temples, eight in number, apparently dedicated to Siva, as I noticed several lingas about, the only visible objects of worship.

The temples were mere shrines built of cut stones, squared and put together without any cement or clamps. No one in the neighbourhood has the faintest notion by whom, or at what period, these shrines were constructed. A quarter of a mile east of the ruins, I found a deserted Kol burial-ground, close to the village of Dáruharu, but the people of Dáruharu dare not use the old burial-ground; the descendants of those whose ashes lie there are gone out of sight and memory. And the Dáruharu people's remains must be taken to a spot two miles distant from their houses! Now I noticed that in this deserted burial-ground a very free use had been made of the stones cut for the temples, the slabs rested on such cut stones, so the deserted burial-ground was in use when the temple was in ruins, but all around have now passed away from the recollection of man, both those who worshipped the Sivas of the shrines, and those of another dispensation who helped to destroy them.

It was past noon when we came in sight of the great Chokahatu* burial-ground. It was then between us and the village of the name, the centre of a great plain, an anomalous interruption to a huge expanse of terraced cultivation. There are no great trees here to shade the graves, the field of mourning has no such solace.

The march had been a long one, and there was no time to lose, as I could not afford a halt, so I set all my clerks at once to work to count the alaba; and to measure the area of the space which they covered. The result gave.

seven thousand three hundred and sixty tombs, mostly of the dolmen or cromlech form, almost covering an area of 22 bighas and 16 kattas, more than seven statute acres, and so close together, that you might traverse the ground in different directions stepping from grave to grave.

Many of the slabs appeared level with, some even below, the surface. Their sunken condition proclaimed their age, as we may presume that originally they were like the others above ground, supported on vertical stones. The horizontal slabs are many of them, huge masses of gneiss of various irregular forms. One, 15 feet 3 inches in length, by 4 feet 6 inches in breadth, was supported on five square pillars, 18 inches above ground; one half-buried slab, nearly elliptical in form, measured 12 feet 9 inches by 9 feet 10 inches; one nearly circular, like a table, 33 feet in circumference; another 18 feet in length had seven legs. A triangular slab properly appeared as a tripod, and one 13 feet 4 inches by 6 feet 8 inches had six legs.

I do not know that I have given the dimensions of the largest; there were many that appeared at least as large as those I measured.

There is no question as to the object of these raised slabs. Chokahatu, the 'place of mourning,' is still used by the Mundas of the village so-called, and nine of the surrounding villages, for the interment of their cinerary urns, and I believe one need not be long there to witness the ceremony. Many of the cromlechs appeared to have been freshly set up, many had about them a look of hoary age.

I obtained a list of villages which have places allotted to them in the burial-ground, and from the census returns, these villages contain nearly two thousand Mundas who by their faith, if they preserve it, must there deposit their cinerary urns. The mortuary statistics of the selected areas of the Lohardagga District give an annual average death-rate of under 20 per mille. If the population and the death-rate were always the same, and every cromlech covered the ashes of only one person, the number of slabs (which we may assume to be 8000, including buried and broken up graves not counted) would represent a period of only 200 years; but if, as with the Kasias, each cromlech is a family vault, and we allow for increase of population as years advanced, and make corresponding deduction in the number of deaths annually, as we count back we might give 1000 to 2000 years as the age of the oldest now existing, and probably excavation would disclose an understratum of similar graves.

I was told on the spot that some of the slabs were known to cover the ashes of several members of a family, but the ashes of one or two great men reposed in solitude. In Singbhum, the latter custom is prevalent; but amongst the Mundas of Lohardagga, the family grouping of ashes is practised.

It is, of course, hard to say what changes may have taken place, likely

to affect the numbers of the Munda people in this part of the country, but there is no reason for supposing that there has been any considerable reduction by emigration. All Mundas who make use of the Chokahatu cemetery, must, in accordance with the creed of the race, be the descendants of colonists who established themselves at Chokahatu or somewhere near it. The founders of the other villages must be offshoots from the first settlement; the probability, consequently, is, that the Munda population of this neighbourhood has greatly increased.

The monumental stones in this part of the Munda country are few in comparison with the scpulchral; but many are noticeable, some in the villages, even within the garden enclosures (as they are always placed by people of the Kharriah tribe), some scattered in the fields as if placed there for the benefit of the cattle, like those whose founder Scotchmen are said to bless, and some in groups. The arrangement of the group is in line, perhaps indicating a line of ancestors or a family. They frequently served for a father, mother, and their offspring; but I do not find that more than one monumental pillar is ever set up in honor of one person. The turban seen occasionally on the central and tallest of a line of such monuments in the Kasia Hills, I have never perceived amongst the Kols; but though I have not myself seen carved pillars erected by Mundas to the memory of the dead,*

I have heard of them.

It appears from Yule's account† of the Kasia cenotaphs, that cromlechs are sometimes found in front of them, a flat stone resting on short rough pillars which form the ordinary road side resting place of the weary traveller. These are not cineraries. I have stated in my 'Ethnology' that the Singhbhúm Kols, when they first set up a monument, make round it a plinth of earth, on which the ghost of the departed or other person who is bold enough to take the seat may rest, but I have recently seen both in the Lohardagga and Singbhúm districts.

Monumental monoliths with little cromlechs in front, ghost seats, resembling exactly the Kasia scats, depicted and described by Colonel Yule, I first saw in Sonapet, a beautiful valley, the hills forming which give birth to the Sona River, an auriferous stream, hence the name. This valley has been held for ages exclusively by Mundas. Each village is a parish with its separate burial-ground and head man, and at the entrance of one of these, the village of Súrsi, I saw a fine monument of this description, raised to the memory of a respectable inhabitant recently demised. The Hargari, or cemetery, was at the other side of the village, and his grave was there shewn to me. So there could be no doubt that the seat was net, as I

Mr. Z. F. Peppé has kindly favoured me with a sketch of such carved william which I forward.

[†] Journal, As. Society, Bengal, No. CLII, 1864.

had at first supposed, the cinerary. The pen and ink sketches herewith sent are of similar monuments in and near the village of Regadih in Kursaon.

As the monolithic monuments throughout the Kol country, nominally, bear no proportion to the cromlechs, we must infer that the erection of the former in the name of the deceased is a much greater and rarer honor than the construction of the latter. In Singbhúm, the Mundas and Mankis are even now ruminating on the expediency of cutting on the pillar at least a name and date to shew to posterity in whose honor it was set up and when; for they admit that the object is not attained under the present system, as the name does not survive to a third or fourth generation.

The same remark applies to many pillars which have been set up to commemorate some solemn compact or action of importance, of which the stone itself now tells nothing. The art of making the stone tell its own story must be taught at the Chaibásá Industrial School.

In some parts of the country, suitable stones are not readily procurable. The first alternative is a cairn, a heap of stones usually constructed round a post, the second the post alone; but the top of the post, if set up in honor of some deceased friend or hero, is credibly carved into the representation of some animal. It looks like a cross between a camel-leopard and a horse. It is, I believe, the Bir Sádom of the Kols, the jungle horse, the Nílgái, Antelope picta.

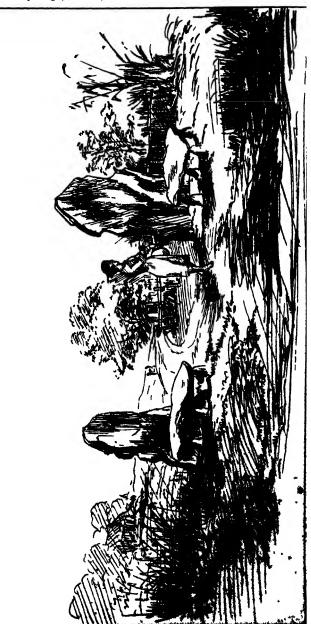
It is obvious that a people thus addicted to the use of these milestones of ages, (without figures unfortunately) must have left traces of themselves in all places which they have successively occupied; and from all I have heard and read and also from what I have seen, I am of opinion that such traces of Kolarian occupation may be found wherever the cognates of the Mundas of Chutiá Nágpúr have been located.

There are traditions of the pre-Aryan Kol occupation of the Bihár and Gayá districts, and Mr. T. F. Peppé, Sub-Deputy Agent, who takes great interest in these questions, has seen the monolithic monuments in Japla, and Balaunja, in Siris Kútúmba, in the wilder parts of the Gayá district, and about Sherghátí. We thus have them up to the Son River and in the Gangetic provinces. Mr. Peppé's note to me on the subject is appended.

From the western parts of the Manbhum district, the Kurmis, it is said, expelled the Kols. We have good proof of this in the fact that the Kurmis are now there in possession, and within their boundaries we find the sites of the old Munda villages clearly indicated by their old cemeteries and occasional monolithic monuments.

In a southerly direction, I have found these Munda footprints as far as the confines of the Sambhalpur district, and indeed in that district, and in Bamra.

In all the places above mentioned, we have either the Mundas in situ, or traditions of their occupation and the stongamonuments to attest the tradi-



REGALDES MONTHENTAL STONES WITH GHOST'S STATS

1873.]

tion; where we find the latter without the traditions or the people, we may still safely infer that we have got on Munda tracks.

Note by Mr. T. F. Peppé.

- 'I have observed the monumental stones all along the boundary between Bihár and Chutiá Nágpúr, and have little doubt they would have been found in the more civilized portions of the Bihár and Patna districts, had not the custom been so common of erecting monumental stones in horor of deceased Hindús at the road sides leading into the village; and all sorts of stones are found set up in this way, many of them rude uncut stones, others parts of temples, and I feel sure many of them have been appropriated from their Kolarian predecessors.
- 'In the wilder parts of Bihár, in parganahs Japla, Balaunja, Sirris Kútúmba and also in Sherghátí, they are often to be met with, and their being found scattered over the country leaves little doubt of their Kolarian origin, to which local tradition assigns them.
- 'In several places, I have seen a singular kind of monumental stone in the Lohardagga district, and the accompanying sketch may give you some idea of those I have seen near Bajpúr, some few miles north of Nugri. They were claimed by the Pahan, or priest, of the village, who said that they had been set up in honor of his ancestors. I have seen them at other places also, but cannot remember where.
- 'With regard to Hargaris, or Harsaris, as they are sometimes called, I think it worth noting that the largest collections are found in the tract of country lying on both sides of the Subanrekhá, bounded on the west by the Chutiá Nágpúr Gháts, on the east by the Ajodia hill, on the south by the Singhbhúm hills, and on the north by the hills forming the boundary between Hazáríbágh and Lohardagga and Mánbhúm. This tract includes the parganahs of Sillí, Barunda, Rahi, Bundú, and Tamár on the west side of the Súbanrekhá, and parganahs Julda, Bygonkudar, Bághmúrí and Patkom on the other side. Judging by the vast collections of grave stones, this tract must have been occupied by a Munda population for a much longer time than any other portion of Chutiá Nagpúr I have seen. As you approach or recede from this centre, the collections of grave stones increase or diminish in number and importance, and it is curious to observe that, in the upper portion of the Damúdar valley, such indications of a Munda population are wanting, only monumental stones being met with.
- 'The largest slab I measured at Chokahatu, was 16 feet by 64, by one foot in thickness, but at Barundah, about two miles to the north-west, there are some much larger.
- 'On remarking the comparative insignificance of the burial places on the plateau with those in the 'Lutur Desum' or low country, I have frequently been told in reply that it is only the Munda and his Bhuinhars who have slabs in the former, whereas down below every Munda family have their slab.

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The History of Pegu.—By Major General SIR ARTHUR P. PHAYRE, K. C. S. I., C. B.

(Continued from p. 57.)

Rádzádirit was succeeded by his eldest son, Binya Dhammá Rádzá. His two younger brothers, Binya Ran and Binya Keng, who were go rnors of Dala and Takun (Rangoon), believing that he bore them illwill, entered into a mutual compact for their own protection. They came then to open war with the king; but Binya Ran made his peace, and was appointed crown prince. Binya Keng then wrote to the king of Ava, asking for assistance, and tendering his allegiance. The king of Ava at this time was -Thihathu. He at once sent a force into Pegu, which occupied Dala, but gave great offence to Binya Keng by plundering the town. Binya Keng, disgusted with his allies, secretly made submission to his brother. Some of the principal Burmese officers were treacherously murdered; and a small remnant of the invading force was allowed to retire to Prome. Binya Keng was now forgiven, and was sent to Dala to put the defences in order. After some time Binya Ran, wishing to have the western provinces under himself, induced Binya Keng to move to Muttama, where he was appointed governor; while Binya Ran had Dala, Bassein, and Tharawati. The king remained at the capital with only nominal authority. The king of Ava at this time was Mengréthíhathú, who ascended the throne in 784 (A. D., 1422). He determined again to invade Pegu, and sent down an army under two generals. Binya Ran decided to enter into an alliance with him, and offered his sister Tsáubomé in marriage. This was accepted, and the princess having first been conscerated as a queen, went to Ava. After this, the king of Pegu was poisoned by one of the queens, instigated, it is supposed. by Binya Ran. He reigned only three years.

The crown prince now succeeded, and is known as Binya Rankit. He allowed Binya Keng to be viceroy at Muttama, where he was almost independent. He enjoyed that power for eighteen years, and was then succeeded by his sister, who was married to an officer of high rank. This king, though he had some causes for dissatisfaction with the king of Ava, did not go to war. In the Burmese history it is stated that, about the year 799 (A. D., 1439), he interfered in the succession to the throne of Taungu, and placed thereon Mengtsán-ú, the son of a former king. This event is not mentioned in the history of Pegu. The rulers of Taungu, at this period, were anxious to be independent of Ava, and the fact is, no doubt, correctly stated. About this time the king's sister, who had been married to Mungthi-ha-thá, king of Ava, under the name of Tsáu-bo-mé, being dissatisfied with her position at that court, fled secretly with the assistance of two

Budhist monks, and came to Pegu. She was received by her brother with a great distinction, and now becomes known in Peguan history as Thakheng, or Sheng-tsau-bú.

When Monhyin Meng-ta-rá succeeded to the throne of Ava, the ruler of Táungú, Theng-kha-rá, declared himself independent, and claimed to be the rightful king of Ava. He entered into correspondence with Binya Rankit, proposing that they should march with their joint armies to take Proper and promising, if he was successful in gaining the throne of Ava, to present annually gold and silver flowers in token of allegiance. This was agreed to, and a force of 35,000 men with five hundred elephants, under the command of Tha-min-pa-rán, and 30,000 men by the river under Binya-in, proceeded to Prome.

The king himself went by water; the king of Taungu marched his men across the mountains, and the allied armies then invested Prome. The king of Ava was too much occupied at home in securing his own position, to be able to send any succour to Prome. The governor of that city was, therefore, obliged to surrender it. But negociations were opened, and Binya Rankit married a daughter of the king of Ava, and then appears to have deserted his ally. Ava and Pegu were now on good terms, but the historian is silent as to what was done with Prome. Pegu was prosperous in this king's reign, and he was much beloved. He repaired and adorned the two great national pagodas Shwé-máw-dau and Shwé-ta-kun. He died in the year 808, or A. D. 1446, after a reign of twenty years.

This king's successor was his nephew and adopted son, Binya Wa-ru, the son of Sheng-tsáu-bú by her first husband. He reigned only four years. He was careful as to the administration of justice; the country was quiet; and there was unrestricted commerce with the adjoining kingdom.

The next king was Binya Keng, a son of Binya Rankit. The Burmese history says that he was assisted to gain the throne by Narapati, king of Ava. He reigned only three years, and was succeeded by Mhau-dau, his cousin.

This King was a cruel tyrant, and put to death all the male members of the royal family whom he could lay hold of. The whole people, clergy and laity, joined against him, and five noblemen put him to death. He reigned only seven months. All the leading men of the country now implored queen Sheng-tsau-bu, the daughter of Radzádirit, to take the sovereign power of the kingdom. She consented and was consecrated. All the people, Mun, Mramma and Kula, rejoiced, and the country had rest. The queen received letters from the kings of surrounding countries, and beyond sea from Ceylon and Bij-ja-ná-ga-ran, with which there was much commerce. The queen was devoted to religion; religious buildings were repaired or erected; and the two great national pagodas were entirely re-gilded. Additional land was assigned to them, and five hundred families were dedi-

cated as slaves to the service of the Shwó Dagun, with a complete establishment of artificers and warders for service, day and night.* One of the Budhist monks who had assisted the queen to leave Ava, was chosen by lot to become a layman; he was then raised to the rank of crown prince, with the title of Dhammádzedi, and was married to the queen's daughter. Being suspicious that the other monk would, from envy, seek to raise a disturbance in the country, he had him put to death. After four years, the queen retired to Talkun, where she built a new palace, the site of which is still presented by tradition. The crown prince remained at Hantháwati, where he carried on the duties of government, but once a month he came to pay his respects to the queen. Sheng-Tsáu-bú, after reigning three years at Ta-kun, died at the age of sixty-five years. Her name is held in high honour among the people to this day; and a national festival to her memory is celebrated once a year at Rangoon.

The crown prince Dhammá Dzedi was consecrated king. Some nobles were discontented as he had no hereditary right; but when they saw how well he ruled the country, they were reconciled to him. He is celebrated in the history of Pegu for his great wisdom. Numerous instances are given of the difficult questions which he solved, and the decisions he gave in various legal suits. Embassies came to him from China, Siam, Ava, Hau (?), and Ceylon. He was earnest in religion. He made no wars, but extended the boundary of his kingdom east of the Than-lwin, establishing the district of Mháing-lun-gyi. His subjects believed that he could make gold. He died after a prosperous reign of thirty-one years, in the year 853, or A. D. 1491. He received the funeral honours of a Tsekya-wati (Chakrawartti), or universal monarch, and a pagoda was built over his bones, which was crowned and gilded all over, as if it were an object of worship.

He was succeeded by his son Binya Ran, whose mother was the daughter of Sheng-tsáu-bú. During the long reign of this king, nothing is recorded as to intercourse with foreign countries, which had been so prominent in his father's time. He made a progress up the Eráwati at the head of a large army, which is called a pilgrimage to the Shwé-zí-gun pagoda at Pugán. When passing Prome, he was received with high honour by the ruler of that city, who appears then to have been an independent prince. At this time, the king of Ava had little power beyond his own city. In the Burmese history, it is stated that Binya Ran made an attack on a fort built by the king of Táungu, but this is not mentioned in the Peguan history. Binya Ran died in the year 888 (A. D. 1526), after a reign of thirty-five years.

For many centuries the servitors and warders of pagedas in Burma have been slaves, that is, persons condemned to the occupation, or descendants of such persons. They are degraded outcasts among the general population. Joshua condemned the Gibeonites to similar occupation. See Book of Joshua, chapter ix. 27.

This king had appointed one of his younger sons to succeed him. This was done through the influence of the mother, but the child was put to death the day his father died, and shother son, named Ta-ká-rwut-bi, who was fifteen years of age, ascended the throne. He paid no attention to the affairs of the kingdom, but passed his time in frivolous amusements with evil companions. He disregarded all warnings, and as many evil portents appeared, and even a flaming comet waved in the sky, the people dreaded some dire disaster. At this time Meng-ta-ra Shwé-htí, called Ta-beng Shwe-hti, was the king of Taungu, having succeeded his father in the year 892, when he was only sixteen years of age. Taungu, from being an insignificant state, had slowly risen to importance, and when Ava fell to a race of Shan kings, the rulers of Taungu gradually came to be considered the representatives of the ancient Burmese monarchy. Binya Ran, no doubt, had made an attack on Taungu which had been repelled. The young king. a warlike and ambitious prince, determined to avenge the insult. His first ' attack on Pegu was made in the year 896. It was unsuccessful, but for four successive years he led his armies against his enemy. At last in the year 900 (A. D. 1538), he mastered the capital Hanthá-wati.* Takárwutbi is said in the Burmese history to have retired to Prome, where he was kindly received by the king; and it is added that the king of Ava, Tho-han-bwá brought a Shan army to his assistance. But Tabeng-Shwé-htí appeared with an army near Prome, and a battle was fought, chiefly by the flotillas on the Erawati, in which he was victorious. But he does not appear to have been strong enough to take Prome; for he retired down the river, and no action was taken to follow him. The unfortunate king of Pegu, unable to induce his allies to support him further, marched down with a small force, and lost his life in the jungle of his native country. In the Talaing history is stated that the king of Ava, who is referred to merely as a Shan Tsáubwá, came down to Pegu with an army to assist Takárwutbi, but as they could not agree to the term of an alliance, the former retreated without doing anything. The king of Pegu then died of sickness in the jungle of the district of Engabu. This was in the year 902 (A. D. 1540), and the Shan royal line of Pegu, which had been established by Wa-re-ru in A. D. 1287, became extinct. The new dynasty pursuing a reckless career of conquest, raised the kingdom to a height of dazzling, but false, prosperity, which excited the astonishment of European travellers. But in less than half a century, the country was utterly exhausted, and the population so reduced by war, pestilence, and famine, that to this day it has not recovered.

The narrative having reached thus far into the sixteenth century, when

^{*} These destructive wars which ended in the conquest of Pegu by the king of Twingu, are described in the Burmeso history. See Journal, As. Soc. Bengal, Vol. XXXVIII, for 1869.

European voyagers appeared in Burma and Pegu, it is desirable to relate what can be gathered regarding those countries from the narratives of travellers which have come down to us. They give, as might be expected, an insight into the condition of the people, which is not to be obtained from the native chronicles. Up to the beginning of the sixteenth century, European travellers had arrived in Indo-China, either by land, by sea from India, or after the Cape of Good Hope route was discovered, from Malacca. At that time there appears to have been no jealousy felt at their presence. That feeling was developed throughout Southern Asia by the conquests of the Portuguese, the Dutch, and the British, by which European dominion seemed, to the minds of the people, to loom like a dark cloud over their destiny.

After Marco Polo, who came into Burma from Yunan towards the close of the thirteenth century, the earliest traveller's narrative which has come down to us, is that of Nicolo Conti, a Venetian, whose travels have been edited by Mr. R. St. Major, for the Hakluyt Society. This traveller, leaving Europe on a trading expedition, arrived by land at Bussora, and sailing from the Persian Gulf reached Cambay. From thence he went to Ceylon and Sumatra, and sailed up the Malay coast to Ternasseri, now Tenasserim. Passing then by Pegu, he went to Bengal entering the mouth of the river Ganges. Remaining some months in India, he returned southward, and sailing apparently from Chittagong, came to the city of Rachan (Rakháing, or in the modern Europeanized form, Arakan), and river of the same name.

From this city he travelled through "mountains void of all habitations, "for the space of seventeen days, and then through open plains for fifteen "days more, at the end of which time he arrived at a river larger than the "Ganges, which is called by the inhabitants 'Dava.' Having sailed up this "river for the space of a month, he arrived at a city more noble than all "the others, called Ava, and the circumference of which is fifteen miles."

It appears most probable from the narrative that Conti was at Ava about the year 1430, which would be in the reign of Monhyin Meng-ta-ra, the eighth in the list of kings who reigned in Ava. The river Dava, it has been suggested by Colonel Yule, was originally written "Fiume d' Ava," the name told to Conti for the Erawati on first reaching that river, after having crossed the Yoma Mountains. The country of Upper Burma he calls 'Macinus,' derived from Mahachin, or Machin, a name which Colonel Yule has shown to have been applied by Muhammadan voyagers both to China and Indo-China. Conti, no doubt, was in company with Indian traders from Bengal, from whom he would learn this name. In the Kin Akbari, it is stated that former writers called Pegu 'Chin.' Conti describes very correctly two methods employed in Burma for catching wild elephants.

He mentions the habit of tattooing the body, and says that the women practise it as well as the men, which is not now the case. The king, he says, has ten thousand elephants, which he uses in his wars. "They fix castles on their backs, from which eight or ten men fight with javelins, bows, and those weapons which we call crossbows." The number ten thousand is, no doubt, an exaggeration, probably double the actual number. From Ava, Conti proceeded towards the sea, "and at the expiration of seventeen days he "arrived at the mouth of a moderately sized river, where there is a port, "called Xeythona, and having entered the river, at the end of ten days, he "arrived at a very populous city, called Panconia, the circumference of "which is twelve miles."

It is not said by what route Conti went from Ava, but apparently it was by land to Raméthen and Táungu. The port Xeythona may possibly be the town of Sittang, but that town being situated on the river of the same name some seventy or eighty miles from its mouth, and the river not being navigable from the sea, it can scarcely be called "a port." The name, therefore, is more probably meant for Tha-htun, which was an ancient and celebrated port, and was still to some extent frequented. It is now mentioned for the last time in the history of Pegu. The populous city of Panconia, a misprint probably for Pauconia, is no doubt Pegu, or, as Conti would have heard it called, Pa-go or Ba-go. The traveller makes no mention of any war between the kings of Ava and Pegu, and from A. D. 1426 for many years no such war is recorded in the native histories. Conti's narrative agrees well with the local histories, and from his notices of the people, the truth of his statements is evident, even when he mistakes some of the native customs. Thus he observes of the Burmese: "All worship idols; nevertheless, when they rise in the morning from their beds, they turn towards the east, and with their hands joined together say, 'God in Trinity and his law defend us."' All pious Budhists in Burma, on first awaking in the morning, invoke or bless the three precious objects "Budha, his law, and his disciples;" but, of course, there is here no reference to God in Trinity.

The next traveller who claims our notice, is Athanasius Nitikin, a Russian, who came to India between 1428 and 1474. He mentions having gone from Ceylon to Shibait and Pegu. He merely observes of the latter—"It is no inconsiderable port, principally inhabited by Indian dervishes." He perhaps means that the principal merchants were Indians, as he says the products of the country were sold by the dervishes. Why he should style them dervish is not apparent, but probably most of the Muhammadan merchants assumed the title of Hájí.

Hieronimo de Santa Stefano, a Genoese, came by the Red Sea to India, to the port of Calicut; thence to Ceylon and Coromandel, which latter

probably means a port on the Krishna or Godávari. From Coromandel, the traveller came to Pegu, and records that he was detained there for a year and a half, and that his companion Hieronimo Adorno died on St. John's day, 1496. He was buried "in a certain ruined church, frequented by none." which refers no doubt to a deserted Budhist kyaung, or monastery. Pegu he calls Lower India, and says of the capital :- " Here is a great lord who "possesses more than ten thousand elephants, and every year he breeds five "hundred of them. This country is fifteen days journey by land from another, "called Ava, in which grow rubies, and many other precious stones. Our "wish was to go to this place, but at that time, the two princes were at "war, so that no one was allowed to go from the one place to the other. "Thus we were compelled to sell the merchandize which we had in the city "of Pegu, which were of such a sort that only the lord of the city could "purchase them. * * * The price amounted to two thousand "ducats, and as we wished to be paid, we were compelled, by reason of the "troubles and intrigues occasioned by the aforesaid war, to remain there a "year and a half, all which time we had daily to solicit at the house of the "said lord." At this time, 1496, Binya Ran was king of Pegu. It does not appear from the native histories that he had any direct war with the king of Ava, but he did attack Dwarawati, a fort belonging to Taungu about this very year 1496; and as the king of Ava affected to consider himself the superior of the king of Taungu, some expectation of hostilities may have existed. An expedition was made up the Erawati a few years later, as we shall see presently. Though the traveller complains of the delay in payment being made for his merchandize, yet he appears to have been treated justly. The property of his deceased companion was seized as a forfeit to the king, such being the ancient law of Burma in the case of foreigners dying in the country. He says, "I was so grieved and afflicted by his death, that it was "a great chance I had not followed him, but " " " * being consoled "by some men of worth, I exerted myself to recover our property. In this "I succeeded, but with great trouble and expense."

The same king Binya Ran, who reigned from A. D. 1493 to 1526, appears from the account of another traveller, Lewes Vertomannus of Rome, to have been, as he expresses it, "of great magnificence and generosity." This traveller came to Pegu about the year 1503. In his narrative, as translated in Hakluyt, he states that he "came to Pego from Bengalla with "a Persian. The city is walled and the houses buylded and very fayre of stone and lime. Here are but few elephants. There are exceeding great reeds, as big as the body of a gross man, or a tub. The king useth not such pomps and magnificence as doth the king of Calicut, but is of such humanity and affability, that a child may come to his presence and speak with him. It is in a manner incredible to speak of the rich jewels, pre-

"cious stones, pearls, and especially rubies which he weareth, surmounting "in value any great city. Not long after, news were brought that the king "of Ava was coming with a mighty force, whom the king with an innumer- able army went to resist." This army probably was the force which Bin-ya Ran led up the Eráwati to Prome, and then on to Pugán. This expedition may have been made to resist an anticipated attack, but in the Taláing history, it is représented, with some dubiousness, as a pilgrimage to the pagodas at those cities. When Vertomannus says, "here are not many elephants," he must mean in the city, for the great strength of Pegu consisted in elephants; or they may all have been gathered at a distance to accompany the army.

Early in the sixteenth century, we have notices of Pegu by Portuguese voyagers, who under Vasco de Gama had doubled the Cape of Good Hope. Their actions in Pegu are recorded in the history of "The Portuguese in India, by Manuel de Faria y Sousa, translated by Stevens into English, and printed at London in 1695." The Portuguese were established at Malacca under Albuquerque in 1510. In 1517, John de Sylvera went to Bengal with four sail. He was invited by the king of Arakan to his country, and he appears to have gone to Chatigam, then a port of that king's dominions. In 1519, it is recorded that Antony Correa, "concluded a treaty with the "king of Pegu at Martavan, when peace was sworn to by both parties with "solemn ceremonies. The metropolis of the kingdom is Bagao, corruptly "called Pegu."

We have seen in the Talaing history that the last king of Pegu was Ta-ka-rwut-bi, who succeeded to the throne in 1526, and was conquered by the king of Taungu, styled Ta-beng Shwé-htí, the capital having surrendered in 1538. How a Portuguese force happened to be present on this occasion but which is not noticed in the native histories, is thus stated by Sousa' "Ferdinand de Morales was sent by the Viceroy with a great galeon to "trade at Pegu. Pegu was then invaded by the king of Brama. Brama had "been tributary to Pegu, but had revolted. The cause of this was that 80,000 "Bramas laboured in the king of Pegu's works. The king used to visit "them, attended only by his women. They suddenly rose and murdered "the king, and fled to their own country. Then Para Mandara, king of the "Bramas, rose, recovered his own kingdom of Ava, and overrun the Lags "and other countries tributary to Pegu. The king of Brama now invaded" "Pegu with such a power, that the two armies consisted of two millions of " men with 10,000 elephants. Morales went into a galliot, and commanding "the fleet of Pegu, made a great havock among the enemy's ships. Brams "came on by land like a torrent, carrying all before him, and his fleet "" covering the river, though as great as the Ganges. With this power he "easily gained the city, and the kingdom of Pegu. At the point Ginamarre"ca was a furious, bloody, and desperate fight. But the Pegus overpowered by the Bramas deserted Morales, who alone in his galliot maintained himself against the enemies, performing wonders with vast slaughter of them; but oppressed by the multitude, he was killed." Of the Peguans generally it is remarked that "their bodies are all wrought blue with hot iron down to their knees. In general, they are not only not civilized, but "very brutal."

In this account it should be observed that the Portuguese historian, writing more than a century after the events described, and probably from imperfect documents, in addition to evident exaggerations on points where the European actors in this tragedy might have furnished more accurate information, has been led to narrate supposed events, which caused or preceded the invasion of Pegu by "the king of Brama." These are in themselves highly improbable, and not to be found in the native histories. king of Brama is, in fact, Meng-ta-rá, or Tabeng Shwé htí, king of Táungu, who, as has already been stated, had by a remarkable train of events come to represent the national party of Burma, against the Shan dynasties of Ava and Pegu. The term Pará Mandara (Phrá Mengta-rá) is a title equivalent to the king's Majesty. In the native histories no distinct cause is alleged for the invasion of Pegu by the king of Taungu; but the relations between the two monarchies, for about a century before, sufficiently account for the event. If "Brama" of Taungu had not been exactly tributary to Pegu, he had for several generations, when it was convenient, depended on the latter to support him in resisting Ava. By the Burmese history, the chief of Táungu, so early as the year 788 (A. D., 1426), had offered to become tributary to Binya Rankit, if he helped him to the throne of Ava, which the chief of Taungu claimed as his right. The two kings had entered into an alliance, and in 1481, the then king of Taungu, fearful of an attack from Ava. sent his wife and children for safety to Pegu. Afterwards, the two kings quarrelled in A. D. 1496, or thereabouts; the king of Pegu attacked Dwarawati, a fort and city belonging to Taungu, but the expedition was unsuccessful. Such an incident as Burmese prisoners or labourers when at work, being visited by a king of Pegu unaccompanied by male attendants, may be regarded as in the highest degree improbable. There is no trace of such an event or of the king's death under such circumstances in the Talaing or Burmese history. The last king of Pegu, of the Shan dynasty, who was dethroned by Tabeng Shwe hti, died, as we have seen, in the jungle, having no army, and the king of Ava having failed to give him further support. Some rumours of his having been assassinated in the jungle may have reached the Portuguese, and have given rise to the tale recorded. "Para Mandara. king of the Bramas" who conquered Pegu, was not the king who recevered his own "kingdom of Ava, and overran the Laos and other countries tributary to Pegu." Those conquests were accomplished many years after the conquest of Pegu, by the successor of Tabeng Shwé htí, who is generally styled Bureng Náung, and by the Portuguese historian 'Branginoco' and 'Chaumigrem.' Both of these kings are mentioned in the Taláing history with the title Meng-ta-rá (to which Phrá would be added in speaking of them); both invaded Siam, and both besieged Prome, so that the error which confused one with the other, is not to be wondered at.

It is doubtful whether Bureng Náung had any hereditary right to succeed Tabeng Shwé htí. His claim seems to have been his great military talent, and his marriage with the king's sister.

The following statement is taken from the Universal History, Vol. VI., published in London in 1781. It professes to derive its information regarding Pegu and the adjoining countries from Portuguese, Dutch, and English authorities. "In 1519, Antony Correa was sent to Bressagukan (Binya "Ran), king of Pegu, to conclude a treaty. That king was slain, in 1539, by some Barma labourers who were furnished by Para Mandara, king of the Barmas. The cause of the rising is not stated. The king of Barma now invaded the country, and Dacha Rupi, the heir to the deceased, was "unable to oppose him. At this time, Ferdinand de Morales arrived with a great galleon, sent by the Viceroy of Goa to trade. He took the side of Dacha Rupi, but they could not resist the overwhelming numbers of the Barmas, and De Morales was slain. This occurred in 1539."

Here we have the names of the two last kings of Pegu, one considerably distorted, and it is Binya Ran who is here said to have been killed by the Burmese labourers in 1539. But that king as we have seen, died peaceably before the great troubles came in 1526. His son and successor Takárwubi, whom we recognise in Dacha Rupi, died (or was killed) in the jungle in 1539 (or 1540, by the Taláing history), and this date with his flight and death in the jungle seems to give the clue to the origin of the story of the king killed by Burmese labourers.

Tabeng Shwé hti, having taken the city of Hanthawati, proceeded to lay siege to Muttama. This city, which lies to the south-west of the ancient capital, and at a travelling distance of nearly one hundred miles, was then governed by Tsau-bi-nya, brother-in-law of the conquered king, who had the rank of a Viceroy. The siege operations against Muttama, or Martaban, are related in detail in the Burmese Mahá Rádzáweng,* but the Taláing narrative is brief, and draws a veil over the final defeat of the Mun race. The besieging army numbered 130,000 men, with numerous vessels of every description. The whôle was under the command of Bureng Náung, the king's brother-in-law, who is called by the Portuguese historian 'Branginoco.' Not a word is said in either of the native histories of Europeans being in the service of the Bergal, Vol. XXXVIII. for 1869.

king of Pegu on this occasion, but it is mentioned that several ships were moored in the river opposite to Muttams, for the defence of the city, which were manned by Muhammadans, called on this occasion in the Burmese history 'Kulá-Pánthé.'* The native histories make the siege occur in the year 1540, while the Portuguese account places it in 1544. The first is probably correct; the dates in the Portuguese history are not to be depended on. But the story of the siege is told in simple language, and reveals the dreadful doom of the Viceroy and his family, inflicted by the pitiless conqueror, which is passed over in silence by the native historians. † The account is as follows: "In the year 1544, the king of the Bramas, by sea and land, "besieged the city of Martavam, metropolis of the great and flourishing "kingdom of that name, whose yearly revenue was three millions of gold. "Chaubainaa was then king, and Nhay Canotoo Queen thereof, who from "the height of fortune fell to the depth of misery. The Brama fleet "consisted of 700 sail, 100 of them great galleys. In them were 700 Por-"tugueses, commanded by one John Cayero, reputed a man of valour and "conduct. After a siege of seven months and five assaults, wherein the "Bramas lost 12000 men, Chaubainaa found it was impossible to with-"stand that power; provision being already so scarce, that they had eaten "3000 elephants. He offered to capitulate, but no conditions were allowed by "the besieger. He, therefore, resolved to make use of the Portugueses, to "whom he had always been very just and serviceable. But man never re-"members favours received in prosperity of those he sees in adversity."

The history then narrates how the unfortunate Viceroy entered into communication with Cayero, through Seixas, a Portuguese in his service, and offered, if supported by all of them, to become the vassal of the king of Portugal. But this was rejected, and a large body of men from the city having deserted, discovered the design to the besieger. The narrative proceeds: "The king thus betrayed, capitulated with the enemy for his own "and the lives of his wife and children, and leave to end his days in retire-

• The Burmese historian has somewhat carelessly applied the word Pán-thé to Muhammadans from India and Persia. In the present day, it is used to designate the Muhammadans of Yunan only. All Muhammadans from countries west of Burma are called 'Pa-thi,' which is believed to be a corruption of 'Fársi.' The word Pánthé has probably a different origin. The Burmese became acquainted with the Muhammadans of Yunan several centuries ago, from the caravans of those people trading to Ava. As their religion, and some of their customs, differed from those of the Chinese, they, to avoid the hateful name of foreigner, spoke of themselves as being Pan-ti or Pun-ti indigenous, and thus, it is believed, the name originated in Burma.

† In the paper on the History of the Burma race, J. A. S. Bengal, Vol. XXXVIII, of 1869, it was stated that the governor of Martaban was pardoned by the conqueror. I am now estimfied that this was not the meaning of a somewhat obscure sentence in the Barmese history.

"ment. This and more was granted easily, because the conqueror designed "to perform no part of the promise. From the city gate to the king of "Brama's tent was a league distance, all which way was a lane of many "thousand musketiers of sundry nations, and next the gate were posted the "Portugueses. The first came out was the Queen in a chair with her two "daughters, and two sons in two others. About them forty beautiful ladies "led by as many ancient ones, encompassed by Talegrepos (a sort of reli-"gious men among them, habited like our Capuchins), who prayed and com-"forted them. Then came the king guarded by his enemies, seated on a "small she-elephant, cloathed in black velvet; his head, beard, and eyebrows "shaved, and a rope about his neck, which moved even the enemy to com-"passion. The unfortunate king seeing the Portugueses, would not stir "one foot till they were removed from that post, and that done went on. "Being come before the king of Brama, he cast himself at his feet, but not "being able to speak for grief, the Raolim of Mounay Talaypor, Chief Priest "of those Gentiles, and esteemed a saint, made an harangue in his behalf, "of force to have moved to compassion any other but that obdurate king. "The miserable king, his queen, children, and ladies were secured. The two "following days were spent in removing the treasure, at which a thousand "men laboured, and it amounted to 100 millions of gold. The third day, the "army had liberty to plunder, which lasted four days, and was valued 12 "millions. Next, the city was burnt, wherein perished by fire and sword "above 60,000 souls, besides as many made slaves; 2000 temples, and "40.000 houses were laid even with the ground. There were in the town "6000 pieces of cannon, 100,000 quintals of pepper, and as much of other "spices. The morning that followed this destruction, there appeared on a "hill, called Beydoo, 21 gibbets, with a strong guard of horse. Thither was "led the queen with her children and ladies, in all making 140, and were all " hanged up by the feet. The king and fifty men of great quality were " cast into the sea with stones about their necks. The army seeing this " barbarity mutinied, and the king was in great danger. He leaving peo-" ple to rebuild the ruined city, returned to Pegu with the rest of his army, " and among them John Cayero and his 700 Portugueses. Of these four " stayed at Martavam."

King Tabeng Shwé htí, before his departure for Pegu city, received the submission of the governor of Maulamyáing, and took the precaution to guard the frontier towards Zimmé. At the ancient capital he was consecrated king. He put the fortifications in repair, and with great solemnity placed a new htí on the summit of the Shwé mau dau pagoda, and afterwards one on that of the Shwé Dagun. He thus proclaimed his sovereignty of the ancient Taláing kingdom. But he determined to push his conquests without delay. As a first step towards asserting his right to the throne of Ava-

he collected an army to advance against Prome, where Meng Khaung was tributary king under the Shan king of Ava, Thohanbwa, whose daughter he had married. Tabeng Shwé htí proceeded with his army up the Eráwati, Bureng Naung being the general in command. He invested Prome by land and water, but did not make any assault, as the place was strong and well defended with guns. While thus engaged, news arrived that the Shan king of Ava was marching down with a large army to the relief of Prome. Half of the army was sent to meet this force. It was under Bureng Naung, who attacked the Ava force with his accustomed vigour and utterly defeated it.* A force from Arakan also, brought to assist the besieged, was compelled to fly. The besieging force having sustained heavy loss, was compelled to trust to famine for the surrender of the city. The unfortunate king of Prome was at length forced to surrender, and proceeding to his conqueror's camp, attended by the superior of the Budhist monks, implored mercy for himself and family. The native histories place this event in the year 904, or June 1542. the siege-having lasted for seven months. The king and queen, it is stated in the Burmese history, were sent as prisoners to Taungu, and no more mention is made of them. The Portuguese history states that the siege occurred in 1546. This is incorrect, but the events recorded may, no doubt, be relied on. The queen of Prome, who was older than her husband, appears to have had the direction of affairs in the city. She offered to pay tribute, and hold the crown from Tabeng Shwe hti. But "the king insisted that the queen "should put herself into his hands with all her treasure; but she knowing "how perfidious he was, resolved to defend herself. He gave several assaults, "and by the sword and a plague that raged in the army, lost 80,000 " men, among which were 500 Portugueses." It is also stated that a mount was raised overlooking the town, and being well armed with cannon left no place of safety to the besieged. But in a sally, the besieged destroyed the mount, and carried off 80 cannons. Tabeng Shwo hti on this occasion was wounded, and "in a rage slew 2000 Portugueses that were upon the guard as negligent of their duty." Probably there is an error here in the number; 200 artillery men being more likely intended. The savage treatment of the king and queen is very different to what is narrated by the Burmese historian. "The queen was publicly whipped and delivered up to the lust of

The Portuguese history has caused some confusion regarding the events which led to this siege by stating—"The king of Brama was alarmed by him of Siam, who attempted to recover the kingdom of Tangu, which had been wrested from him." For Siam here must be understood the northern Shan or Shian confederation, now led by the king of Ava. This king did claim the allegiance of Tangu, which state had formerly been subject to his predecessors. It was never claimed by Siam. The Siamese and Shians both belong to the Thái race, and the early European writers may thus occasionally have confused the two. In Father Sangermano's work on Burma, the Shan people are always called 'Soiam'

"the soldiers until she died. The young king was tied to her dead body and cast into the river. The same was done with 300 gentlemen, after stakes were drove through their bodies."

Tabeng Shwé htí appointed one of the brothers of Bureng Náung tributary king of Prome, with the title of Tha-dodhamma Ridza. He then returned to Hanthawati, where he endeavoured by works of religious merit to atone for the guilt of bloodshed. He cast a pure gold image of Budha, and next built a new palace. But he was not left long in repose. In Ava on the death of Tho-hanbwa, the chief of Unbaung named Khunmhaing-nge had been elected to the throne. He determined to retake Prome. He marched down at the head of an army formed of the troops of seven Shan chiefs. Tabeng Shwe hti quickly came to the rescue of his tributary king. The Shans once more were defeated near Prome, and Bureng Naung followed them up the Erawati, capturing all the cities as far as Pugan. He also appeared before Ava, but apparently thinking it too strong to be safely attacked, the army returned to Pugin, and there he established his frontier post.* The king having taken measures for the safety of his army. returned to Pegu, where he arrived in the year 906, or August, 1544. In the following year, he was again solemnly consecrated, assuming the title of King of Kings, which may be translated 'Emperor.' The tributary kings of Prome, Taungu, and Martaban were present to do homage; and Bureng Naung was formally declared Ein-Shé-meng, or crown prince.

About this time, the king of Arakan died, and Tabeng Shwé htí made an expedition to that country, to place his brother on the throne. The emperor appears to have failed to take the capital, but eventually the son of the late king, styled Mahá Dhammarit, on agreeing to present gold and silver flowers, was confirmed on the throne, and the emperor then returned to Pegu. This expedition occurred in the year 908, or A. D., 1546-47. The return of the emperor seems to have been hastened by news of a movement, which this time was really made by the king of Siam. That monarch had lately taken possession of Tavoy, a town which for many years had been a disputed possession between the two countries. The emperor determined to punish this aggression, not by seizing the town in question, but by marching on the capital of his enemy. All the arrangements were as usual entrusted to Bureng Náung. The emperor left his capital in the year 910 (November, 1548), and proceeded to Muttama (Martaban), where the army had already

* This expedition up the Erawati, called the 'Queytor' by the Portuguese historian, has by him been mixed up with the siege of Prome two years earlier. It is said that the invader returned from Ava, because he heard the king of Siam was coming to its relief. This can only refer to the northern Shans. In the native histories, no reason is given for the retreat from Ava, on this occasion. The Portuguese historian then refers to the Empire of Calaminam, and to affairs which occurred many years later, but of which the writer evidently had a very confused notion.

assembled. The plan was to march eastward from that city to Myawati on the Thaung-vm River, and from thence to the upper course of the Mo-nam, the 'mother of waters', on which river Yodaya, the then capital of Siam, was situated. The army occupied in succession the fortified cities of Kamanbsik, Thauk-katé, and Pi-tha-lauk, and then moved down by land and water to the capital. But from the strength of the wall, the deep and broad moat, the numerous water courses, and the ships moored and armed with guns manned by foreigners, the city was deemed to be too strong for an assault, and the emperor, with the advice of Bureng Naung, determined to retire. retreating towards Kamánbaik ('Camambee' of the Portuguese) and the other places they had captured, they were attacked by the Siamese, but entirely defeated them, and even took prisoner a son-in-law of the king's. According to the Burmese history, the king of Siam then entered into negociations and promised, if his son-in-law were released, to pay tribute. This was agreed to by Tabeng Shwé htí, and the invading army then retired. The king returned to his capital in April, 1549.

The Portuguese history gives two accounts of this expedition; one in the first volume, in which it is (wrongly) represented as the second invasion of Siam by Tabeng Shwé hti, and states that the Portuguese who accompanied the army, were only 180 men under James Soarez; and another more detailed account in the third volume, in which the Portuguese force is stated to have been one thousand. Both accounts give the year 1549 as the date of the expedition, and the Burmese history states that it lasted from November 1548 to April, 1549. In the Burmese and Talaing histories, not a word is said as to the leader of the Portuguese, James Soarez de Melo, though they speak generally of foreigners. But there is no doubt that the guns, which were worked by the Portuguese, were regarded with great importance by the emperor. The Portuguese history after relating that an illegitimate son of a murdered king of Siam had succeeded to the throne, continues thus:-- "The king of Brama, or Pegu, for it is the same, seeing the affairs "of Siam in confusion, resolved to conquer that kingdom. He raised an "army of 800,000 men, among which mere 1000 Portugueses, 40,000 horse, "60,000 musqueteers, 20,000 elephants, 1000 cannon drawn by as many. "yoke of oxen and Abadas, and 1000 waggons of ammunition drawn by "buffaloes. The Portugueses were commanded by James Soarez de Melo. "called the Gallego, who came to India in the year 1538; in 1542, was "pyrating about Mozambique; in 1547, was at the relief of Malacca; "and in 1549, being in the service of this king, was worth four millions in "jewels and other things of value, had a pension of 200,000 ducats yearly. "and the title of the king's brother, was supream governor of all his "dominions, and general of his army." The king marched with that The position of Soares is here perhaps exaggerated; but that he held a high

"prodigious multitude, and after one repulse took the fort of Tapuram, defended by 2000 Siamites, putting all to the sword with the loss of 8,000 men. By the way the city of Tuvopisam surrendered, and he sat down before Odias, the capital of Siam, which seemed to make no account of that great power. James Soarez, who commanded in chief, surprized hereat, gave an assault and lost 10,000 men. Another attempt was made with elephants, but with no better success. * * * * * Five months being spent with the loss of 150,000 men, news was brought that "Xemindoo, a man of great parts had rebelled at Pegu and killed 15,000 men that opposed him. As soon as this was known in the camp, 120,000 "Pegues deserted, in hatred to that foreign king that oppressed, and to the "insolence of James Soarez who commanded them."

It appears that there were some Portuguese in the city under the command of James Percyra, who served the guns, and probably caused the failure of the attack. Certain differences are apparent in the accounts of the native historians and of the Portuguese, as to the causes which led to the retreat of the Burmese army. The former attribute it to the prudence of the king on seeing the great difficulties before him; and omit to mention the failure of an assault. The insurrection of Xemindoo in Pegu at this time also is not mentioned. But it broke out, according both to the Burmese and Taláing histories, immediately after the return of the army, and possibly the presence of the discontented Taláing soldiers was deemed a favourable opportunity. Before the insurrection, the Burmese history relates that king Tabeng Shwé htí had become utterly incapable from constant drunkenness, the liquor being supplied by a nephew of James Soarez, a youth to whom the emperor had taken a liking, and who was his constant companion.* At length, Bureng Náung banished this young man from the country, and then took the whole power into his own hands. His father, who was the tributary king of Taungu, had died in the previous year, and one of his brothers or kinsmen had been appointed with the title of Meng Khaung. Bureng Náung was the virtual ruler of the empire, and the acknowledged successor of the emperor, to whom he appears to have been a faithful officer.

It was in the month Pyatho, 911 (December, 1540), according to the Burmese history, that the insurrection of Thamin-htau, or Thaminhtau rá ma, broke out. He is called by the Portuguese 'Xemindoo.' He is represented in the Taláing history as being a son of Binya Ran, the last king but one of the dynasty of Wararu, by an inferior woman of the palace. He had been

post is apparent from the Burmese history, in which subsequently his name occurs as Pits-tsa-rit, with the affix "Meng," or Lord. His miserable end will be seen hereafter.

• In a reyal order, issued not very long ago, degrading an officer of high rank, this historical incident was referred to, as illustrating the evil effects of drinking intoxicating liquor, and the danger of familiar association with foreigners.

a Rahán, but threw off his monastic habit and became a layman. He then took the name of Thaminhtau, and began to collect followers in the delta of the Erawati, where the Mun race was most numerous, and where a rebel force could most easily avoid attack. He was at first very successful, having taken Dála and even Syriam; he then marched boldly to attack Makau, a fort only sixteen miles south of the capital. Here he was attacked by troops sent from Hanthawati, and was defeated. He retreated to Syriam, where Bureng Naung routed his followers. He fled westward, and Bureng Náung followed him up, and fixed his head quarters at Dála, from whence he sent out parties in all directions to hunt down the fugitives. During this confusion, the emperor was under the care of the governor of Tsit-taung, who had the title of Thamin-tsau dwut, or Thamindurit. He is called by the Portuguese historian 'Xemin of Zatan.' This young man also was a scion of the Shan royal family of Pegu. He had been educated at the same kyoung as Thaminhtau, and was strongly recommended to the emperor by the Phungyi, or abbot, of the monastery. He was soon taken into favour, and was entirely trusted by Bureng Naung. His two younger brothers had appointments in the palace, one being commander of the emperor's bodyguard. The emperor had gone for change to a temporary palace at Pantarau, when a report was brought, no doubt to draw him away to a remote place, that a white elephant had been seen east of the Tsit-taung River, near the ancient city of Katha. To capture a white elephant at this juncture would have a good effect on the whole people, and the emperor was easily inveigled into the jungle at the foot of the mountains. There he was murdered by one of the brothers of Thamindwut, in May, 1550. The latter at once proclaimed himself king at Tsit-taung, and soon after took possession of Hanthawati, where he was consecrated according to ancient custom.

Tabeng Shwé htí had reigned ten years in Taungu, his native kingdom, and ten years as emperor in Hanthawati. The Talaing history records that he made great gifts to the national pagodas of Shwé-maudau and Shwé Dagun; and that he constructed a road between Pegu and Taungu, with wells, zayats, and gardens for the use of travellers. This road, which was well raised above the level of ordinary floods, still exists. He built a pagoda at Taungu, which was completed only the year before his death, as has been proved from an inscription on a silver scroll, discovered at that city a few years ago. The pagoda was built for the benefit, by means of the merit acquired by building it, of himself and family, and in memory of his father. He was only thirty-six years of age when he died.

Bureng Náung was at Dála when these events occurred, and finding the strength of the country against him, determined to march to Taungu. • On the way he was joined by his wife who managed to escape from the city. When arrived at Taungu, he found that his brother Thi-ha-thu

would not open the gates to him. But all the best officers, Burma, Talking. and Shan, had great confidence in him, and gathered to his camp. A force sufficient to blockade the city was thus collected. In Pegu the struggle went on between the two Talaing chiefs, Thaminhtau and Thamindwut The latter, in possession of the capital, exercised his authority with such cruelty, that the nobles called in his rival, who advanced with an army collected principally at Muttama. A battle was fought near the city in which Thaminhtau was victorious. Thamindwut was taken prisoner and beheaded. He had reigned for three months and a half. These events are thus recorded in the Portuguese history: "Xemindoo (Thaminhtau) "rebelled against the king of Pegu (Tabeng Shwé htí), and sent James "Soarez to suppress him. He followed him to the city of Cevadi, and he "slipping by, got into Pegu, because the city sided with him. The queen "fled to the castle, + where she was defended by twenty Portugueses till the king came and put the rebels to flight. The army entered the city and " put to the sword not only men, women, and children, but even the beasts; "nothing escaped, but what was within the liberty of James Soarez his house, "which the king had ordered should be exempted. Above twelve thousand "saved themselves therein. The plunder was unaccountable. James Soarez "alone got above three millions. At his intercession, the king pardoned a "Portuguese who had furnished Xemindoo which ammunition. Though the "king escaped the hands of Xemindoo, he could not the villainy of Ximi-de-"Zatan (Ximi is equivalent to a Duke, and he really is one of Satan's crea." "ting), who murdered him in the delightful city of Zatan. The traytor was "immediately proclaimed king, and falling among the murdered Prince's "men, killed three of those that belonged to James Soarez, who fled to the "city Ova, and afterwards at Pegu was reconciled to this new king, till "Xemindoo, who fled before, came on again with a powerful army. Ximi "commanded James Soarez and his Portugueses to march with him against

^{*} The Portuguese historian here confuses Thaminhtau (Xemindoo) with Thamindwut (Ximindezaton). The first did not enter the city of Pegu until he had conquered the last; whereas Thamindwut entered the capital in little more than a month after the murder of the Emperor. Covadi is Saráwadi, == Tharáwati.

[†] This may be either the queen of Tabeng Shwé htí or of Bureng. The latter as we have seen soon after joined her husband.

[‡] This can only refer to Bureng Naung on his march to Taungu, when, though he was not attacked, he did not venture to enter Pegu city.

[§] This sentence can only refer to the taking of the city by Thamindwut, when his army would be sure to plunder the city. The Portuguese historian has been puzzled by the numerous "kings," who in a short time enjoyed that title among the people.

^{||} Tabeng Shwé htí was murdered some distance from the city, but within the territory pertaining to Tsit-taung (= Zatan).

"the enemy; but before he came thither, the punishment of his great inso"lence reached him, as we shall see hereafter. Zatan was taken and beheaded
"by Xemindoo, who gave out it was for the killing of Soarez, as if the
"murder of the king had not been a more justifiable motive. Thus the
"first rebel possessed himself of the crown till Mandaragri,* the late king's
"brother-in-law, claimed it in right of his wife, and coming to a battle,
"gave him such a total defeat, that Xemindoo fled to the mountains where
"he married a poor fellow's daughter. He discovered himself to her, and she
"revealed it to her father, at such time as great rewards were proposed to
"such as should discover him. The father-in-law delivered him up to the
"king who cut off his head."

In a subsequent part of the history, this story is again told, but with some variations, and the battle between Xemindoo and the king (Bureng Náung) is erroneously represented as having occurred before Xemin de Zatan became king, thus antedating the event by more than a twelvemonth. The account is extracted, as it relates the fate of Soarez in the city of Pegu, after he became "reconciled" to the usurper. "Xemindoo was of the "ancient blood royal of Pegu, a great preacher and esteemed a saint. "made a sermon so efficacious against the tyranny of princes and oppression " of that kingdom, that he was taken out of the pulpit and proclaimed king, "whereupon he slew 5,000 Bramas in the palace, seizing all the treasure, and "in a few days all the strongholds in the kingdom submitted to him. "" armies of the two kings met within two leagues of the city of Pegu. That " of Brama consisted of 350,000 men, Xemindoo's of 600,000. Of the latter "about 300,000 were slain, and 60,000 of the former. The victorious king "entered Pegu, and contrary to agreement slew many, and seized great trea-"sures. Meanwhile the city Martavam declares for Xemindoo, killing 2,000 "Bramas. Xemin of Zatan did the same in the city of that name. The king "marched towards him, but he contrived to have him murdered by the way. I "This was the end of that tyrant. Xemin was proclaimed king by his party, "and in nine days gathered 30,000 men. Chaumigrem, & brother to the dead "king plundered the city and palace, and fled to Taungu, where he was born. "Xemin de Zatan became so odious by his ill-government, that in four months " many of his subjects fled, and some joined with Xemindoo, who made an "army of 60,000 men. Let us leave him awhile to relate the end of James

- Mengte-ragyi,

 Bureng Náung.
- † Thaminhtau was defeated at Makau. sixteen miles from Pegu, before the other rebel had murdered the king. But that is evidently not the battle alluded to.
- ‡ As has already been seen, this entirely misrepresents the circumstances under which Tabeng Shwe hti was murdered.
- § Chaumigrem is another name for Bureng Náung, but is here probably meant for his half brother Thihathu, who left the capital when the king was murdered, and retired to Táungu.

"Soarez de Melo, after the wonderful rise already mentioned. James Soarez " passing by a rich merchant's house on the day after his daughter's wedding "and seeing the great beauty of the bride, attempted to carry her away by "force, killing the bridegroom and others who came to her rescue. Mean-"while the bride strangled herself. The father expecting no justice while "that king reigned, shut himself up, and never stirred abroad, till Xemin de "Zatan coming to the crown, he so lamented his wrong about the town, "that above 50,000 of the people gathered about him, crying out for justice. "The new king fearing some worse consequence, caused Soarez to be appre-"hended and delivered up to that rabble. This was accordingly performed, "and the multitude stoning him, he was in a minute buried under a heap "of rubbish. No sooner was that done, but they took the body from under "that pile, and tearing it in pieces, delivered it to the boys to drag about "the streets, they giving them alms for so doing. His house was plundered, "and the treasure found being much less than what was expected, it was "believed he had buried the rest. The new king, Xemin de Zatan, soon "followed James Soarez, for his subjects no longer able to bear his cruelty "and avarice, fled in great numbers to Xemindoo, who was now master of "some considerable towns. He marched to the city of Pegu with 200,000 men "and 5,000 elephants. Zatan met him with 800,000, and the fight was "long doubtful, till Gonsalo Neto, who with 80 Portugueses followed "Xemindoo, killed Zatan with a musket shot, which opened the way for "Xemindoo into the city, where he was crowned on the 3rd February, 1550." "Gonsalo Neto received 10,000 crowns for that fortunate shot, and his "companions 5000."

It may be well here to explain how the Portuguese historian has failed to recognise Bureng Naung when mentioned under other names or titles. He probably drew information from letters and reports sent by many different officers through a long series of years to the Viceroy at Goa, and these were not used for the history until about a century later. Bureng Naung was for ten years the general of the armies of Tabeng Shwe hti. and afterwards his successor. When he became emperor, he assumed different titles at different periods, and the writers of reports regarding him probably used these different titles, so that it would not be possible without some key to understand that they all referred to the same person. The term Bureng Naung is rendered 'Branginoco' by the Portuguese, and in some accounts his actions, under this title as general, are attributed to him as king. Mandaragi is a common title for a king, used in conversation. The term 'Chaumigrem' is for Tsheng-phyu-mya sheng, = Lord of many white elephants, one of the later titles assumed by Bureng Naung. The letter 'u' in Chaumigrem, is a misprint for 'n.'

In another part of the Portuguese history, as we have seen, it was

stated that "Zatan was taken and beheaded." Yet the fortunate shot of Gonsalo Neto is told very circumstantially and can scarcely be an invention Perhaps the wound inflicted led to his capture.

Thaminhtau was now declared king, and was consecrated after the ancient custom in the capital. He is henceforth called in the Taláing history 'Dzag-ga-li Meng.' The Taláing historian dwells fondly on the details of the consecration, which was the last received by a native sovereign in Pegu.

While these events were passing in Pegu, Bureng Náung had forced the city of Taungu to surrender. He forgave his half-brother Thihathu, who had refused to acknowledge him, and had taken the title of Meng Khaung. Bureng Naung then caused himself to be consecrated king, as successor to his father who had been tributary king of Taungu under the late emperor. He next determined to possess himself of Prome, where another of his brothers had, under Tabeng Shwé hti, been tributary king, but of which a noble, styled Thadothu, had possessed himself. He marched across the hills, and after some delay Prome was surrendered by treachery, and Thadothu was put to death. His brother Thado Dhamma Radza was then reinstated as tributary king. It was now the year 913 (A. D., 1551), and Bureng Naung had possession of Taungu, Prome, and the country of the Erawati as far north as Pugan. In Ava, a struggle for supremacy was still going on among the Shan chiefs, and Bureng Naung deemed the time propitious for asserting his claim to that kingdom as the successor of Tabeng Shwe htf. But hearing of attacks from the Pegu side on his territory, he considered it prudent first to settle affairs there, and concentrated his forces for that purpose at Prome and Taungu. Just the Mobyé Meng, king of Ava, being conquered by Tsithu-kyau-hteng, had fled and taken refuge in Prome. Bureng Náung determined to invade Pegu from Táungu, and marched to that city, taking Mobyé Meng with him. He set out on his expedition in April, 1551. His army consisted of 110,000 men, 400 fighting elephants, and 5000 horses.

In Pegu Thamin htau, according to the Taláing history, had entered the capital in August, 1550. Having placed his own adherents in the several districts of the delta, he, in November, marched against the governors of Martaban and Maulmain, who had refused to submit. Having subdued both without difficulty, he returned to Hanthawati. He received an embassy from the king of Arakan, and did everything possible to make himself popular, and above all, to acquire religious merit by gifts to the pagodas and monasteries. But hearing of the surrender of Prome to Bureng Náung, he knew he would soon have to fight for his kingdom; and it was not long after, that news was brought that Bureng Náung himself was marching down by land from Táungu, and that a force under the king of

Prome was coming by water. He determined not to await attack in the city. The samy took post at Muanu to await the Burmese enemy, and the battle took place close to the capital. A portion of the city was set on fire during the engagement by a force detached for that purpose by Bureng Náung, in order to alarm the enemy. Thaminhtau fought with courage, but his army was defeated, and he was obliged to leave his elephant, and mount a horse to fly from the field. He fled to Dala. Bureng Náung entered the city on the following morning. The battle was fought in the latter end of April, 1551. There probably were Portuguese on both sides in this battle, but no detailed account of it is to be found in the Portuguese history. The clearest reference thereto is in the following passage-" Chau-"migrem who, the year before, retired to (from) Pegu, hearing afterwards "that Xemindoo was unprovided, marched against him, and obtaining "the victory, brought that crown again under the subjection of the Bra-" maes. Xemindoo, taken some time after, was publicly beheaded." And again we read in another volume-" The first rebel possessed himself of the "crown, till Mandaragi, the late king's brother-in-law, claimed it in right "of his wife, and coming to a battle, gave him such a total defeat that " Xemindoo fled."

Most of the Taking nobles submitted to the conqueror. On the third day after the battle, Bureng Náung started in pursuit of Thaminhtau, who was striving to rally his followers in the forests of the delta. Being at last compelled to fly, he once more assumed the dress of a Phungyi, or Budhist monk, and took refuge in the district of Bassein. From thence he found means to fly with a few followers by boat to Muttama.

Bureng Naung remained at Bassein until August, 1551, settling the affairs of that part of the country, and then returned to Pegu city. His first care was to repair the holy buildings injured during the war, and he built a Dzé-di over the remains of Tabeng Shwé-htí. Not long after, the unfortunate Thaminhtau, having been betrayed, was brought in. Bureng Naung offered him his life, if he would make obeisance; but this, the Talaing history states, he refused to do, and he died of a wound he had already received. The Portuguese account says that he was beheaded; and the Burmese historian merely observes, "An evil-minded man, had an evil death."

Muttama having now been occupied, another of Bureng Náung's brothers was made tributary king with the title of Meng-re-tsí-thú. Bureng Náung assumed the title of King of Kings or Emperor; and his eldest son was declared Mahá Upá Rádzá, or Crown-prince. The emperor ruled over a wide extent of country, and prepared to assert his claim to the throne of Ava; for as the successor of Tabeng Shwé htí he assumed the title of king of the Burma race, though neither of them had reigned in the country of Burma proper. An army was sent up the Eráwati in July, 1553, under the

command of the Crown-prince. Either this was intended only as a reconnoitring expedition, or the strength of the king of Ava, Tsí-thú kyau hteng, had been miscalculated. The Crown-prince advanced no further than Pugan, and was then recalled.

During this year great exertion had been made to build the palace, which was completed in November, when a grand festival was held. The emperor was then, as stated in the Taláing history, consecrated according to the ancient ceremonics. Numbers of boats were being built in all parts of Pegu, and provisions were collected along the Eráwati as far as Pugán, with a view to an advance to Ava. In July 1554, the son and the nephew of the king of Arakan arrived. The latter was married to one of the emperor's daughters, and the former to a daughter of the king of Muttama. In November, the army of invasion set forth. The Crown-prince was left at the capital as his father's representative. The army in two main columns, one of which accompanying the flotilla, proceeded up the Erawati route. The other with which was the emperor, marched from the capital to Taungu. From that city, the emperor led a corps across the hills to Taung-dwen-gyi, and on to Pugán, where they joined the water column. The remainder marching from Taungu under the emperor's brothers, Meng Khaung, king of Táungu, and Meng rai kyau hteng, entrenched themselves to the south of the ancient capital Panya, to await intelligence from the emperor. The main army by means of the flotilla crossed the Erawati to the western bank, probably because provisions were more plentiful there than on the other. The march was continued along the right bank, and up the Khyendwen to Amyen, where that river was crossed. The army then marched to Tsagaing, situated on the Erawati opposite to Ava. The emperor's first care was to communicate with his brother's who were entrenched near Pányá. Arrangements for an attack on the city having been made, the two brothers issued from their entrenched position, but were at once attached by Tsithu-kyau-hteng, the king of Ava. He was, however, defeated and forced to retire into the city. The emperor's army now crossed the river, and a combined attack was made. Ava was taken in March 1555, and the king, the last of the Shan dynasty, was made prisoner. Ho was well-treated and sent to Pegu. But two sons of the last native king of Pegu who were found here, were put to death. The emperor's brother Meng-rai-kyau-hteng was made tributary king of Ava, with the title of Tha-do-meng-tsau. The emperor delighted to continue Hanthawati as the capital of his empire, but determined to remain at Ava until the northern Shans were subdued.

It is much to be regretted that the Portuguese historian gives no account of this expedition, though it is almost certain that Portuguese are alluded to in the Burmese history, which speaks of four hundred Western

foreigners dressed in uniforms and armed with muskets, whose position was in front, flanks and rear of the emperor's elephant. In the following passage, however, the Portuguese historian no doubt alludes generally to the conquests of Bureng Náung, including the campaign of Ava. The "kingdom of Pegu, before not very considerable, was raised to be one of the greatest empires in Asia, by the king of Uva and Brama, assisted by 1,000 Portugueses under the command of Antony Ferreyra de Braganca, who served him as his natural prince."

Columns were despatched into the country north of Ava, and the emperor himself proceeded to Myé-du on the Mú River. But the rainy season being at hand, and the troops worn out with fatigue, it was deemed expedient not to advance further at this time. A garrison was placed there, and the emperor himself returned to Ava, and thence to Pegu, where he arrived in June, 1555. The new king of Ava remained in his capital.

The emperor had before determined to build a fortified post at or near the ground where he had defeated Thaminhtau, and it was completed in this year. This is referred to by the Portuguese historian in the following words: "The king, not thoroughly satisfied with the people of Pegu, built, not far from it, another great and strong city." The emperor was careful to observe what was required of him as a good Budhist. Additional gold was placed upon his father's pagoda at Taungu, offerings were sent to the holy tooth relie in Ceylon, communication having been opened with Dhammápála, the king of that island. A scandalous custom which had hitherto prevailed, of annual sacrifices of animals to the Náts of the Mountain Pup-pa, which had existed from the time of the kings of Pugán, was suppressed as contrary to religion. In the Burmese history, it is stated that many thousands of people used to assemble annually to sacrifice bullocks, buffaloes, pigs, and other animals on this occasion."

About this time the Tsaubwá of Unbaung having died, a dispute occurred among the relations as to the succession. The member of the family who succeeded was then attacked by the Tsaubwá of Moné, and he appealed to the emperor for assistance. The emperor deemed this an excellent opportunity for subduing the whole of the Shan country, and determined first to proceed against those in the north. A large army under the king of Taungu was assembled on that frontier to watch the southern Shans; while the emperor himself proceeded with his whole court to Ava, where a large army was also assembled. He arrived there early in 1557, and soon after proceeded up the Erawati to Tsampanago, where his army was assemented. He then marched to Momeit, the Tsaubwá of which state had joined the enemy, while the king of Ava and other commanders proceeded against

^{*} Similar oustoms still exist in some remote parts of the country, though utterly contrary to Budhism.

Unbaung. The whole of the country east of the Erawati was subdued and annexed to the kingdom of Ava. As many heretical customs existed among the Shans, the observance of these was prohibited. On the death of a Tsaubwa, it had been the practice at his funeral to sacrifice his riding elephant, his horse, and his favourite slaves, and bury them in one grave with him. This was in future strictly prohibited. Pagodas for worship were erected; kyoungs were built, and orthodox monks placed in them, in order that religious duties might be exemplified and observed. Weights and measures were introduced in accordance with those existing in Hanthawati, and officers of justice appointed. Thus did the emperor provide for the temporal and spiritual welfare of the people. The emperor then determined to march against Modyin and Mogáung, which had formerly been subject to China.* For this purpose, he crossed to the west bank of the Erawati, and after an arduous march north subdued both those states. The Mogáung Tsaubwá swore fealty, and the Monyin Tsaubwá was taken as a hostage, his son-in-law being appointed chief. The same reforms were introduced into these states, which had been enforced in Unbaung and Momeit. The emperor had now subdued the country as far north as the Patkoi range of hills, which eseparates Burma from Asam. He returned to Ava, and from thence proceeded to Pegu, which he reached in August, 1557.

But already another disturbance had arisen among the restless Shan chiefs. The Moné Tsaubwá had attacked the chief of Thí-bá. The emperor determined to punish both. In November, he marched to Táungu and across the mountains towards Moné. Many Tsaubwás had united their forces, but were defeated. The emperor pardoned the Moné chief on account of his youth; but in this and the adjoining states the reformed worship was introduced. These states received the name of Kambaudza, or this ancient name was now revived.

The emperor now held a council as to future proceedings. It was agreed that, as all the northern Shan states west of the Than-lwin river, except Thinni, had been subdued, nothing should at present be attempted in that direction. Thinni was still subject to China, and should not be interfered with. But it was determined to march against the Ywun Shans of Zimmé, after which it would be easy to occupy the country of the Gun or Gyun, Kyáing-run and Kyáing-tun, with other neighbouring states bearing collectively the classic names of Mahánágora and Khemáwára. The army was at once put in motion from Moné, and made twenty-four marches to

• The northern Shan states in the valley of the Erawati had, no doubt, been tributary to China. In the sixteenth century, the Ming dynasty had become weak, and the Manchoos had begun to assail the empire. It was these circumstances, probably, which determined Bureng Naung to attack these out-lying districts of the Chinese empire.

the Hta-tseng-tsheik on the Than-lwin, where that river was crossed. From thence twenty-one marches brought the invader to Zimmé. The king of that country had determined to defend himself in his capital, which was well provided with jinjáls. The emperor, however, had so large a force with superior artillery, that he surrounded the city and compelled a surrender. The king swore fealty, the emperor asking him if even the great ruler of China could help him. He agreed to pay an annual tribute of elephants, horses, silk, and other natural products of his country. Many artificers with their families were carried away to Hanthawati. No religious reforms were considered necessary. An army of occupation, numbering fifty thousand men, was left in Zimmé, and was placed on the frontiers of Siam and Leng-dzeng. The emperor then set out on his return to Ava. Being suspicious of the conduct of the Tsaubwas of Mong, Ngyaun-ywe, and other states, they and their families were detained as prisoners. The Tsaubwá of Thinní appeared with presents, but was not required to make his submission. The emperor arrived at Ava, in August, 1558. There he remained settling the country and repairing the religious buildings. All the Tsaubwas in the hills cast of Bamau appeared and did homage. While thus engaged, news was brought that the king of Leng-dzeng* was assembling force, to attack the Burmese army in Zimmé. The king of Ava was at once sent with reinforcements, and he forced the king of Leng-dzeng to retreat. Some cities nearer to the Me-kong River were now occupied, and the king of Ava was then recalled. The emperor returned to Pegu in May, 1559.

He had before commenced the foundation of a pagoda, and the work was now pushed on. Numbers of supposed holy relics were placed in the relic chamber, with golden images of the family of Budha and his disciples, and of the royal family. The religious zeal of the emperor did not stop here. He was shocked at the number of animals put to death by the Muhammadans at the capital and other cities. Those people seemed actually to rejoice in taking the life of a goat or a fowl. The emperor desired to put an end to such sinful deeds. He built a magnificent Tatshaung, or place of assembly, and ordered the foreign people to attend. The true religion was then preached by the royal teacher, and numbers of the foreigners embraced the doctrine of the three treasures.

^{*} Leng-dzeng is the Burmese name for the ancient Laos kingdom, east of the Mekong, or river of Cambodia, of which either Muang Luang Phaban, or Vien Chan, called also Lantchiang, was the capital. It is now subject to Siam. See Captain McLeod's Journal, p. 39, and Travels by Louis de Carné, p. 125.

[†] There are in Pegu a number of families who are Budhists and in no way distinguishable from the people of the country, but who state that they are of foreign origin. They bury their dead and erect tombs over them; and they abstain from eating pork. In other respects, I am not aware that they have any peculiar customs. It is probable they are descendants of those converted by Bureng Náung, whose

The empire enjoyed rest for nearly three years. The chief of Kathe (Manipur) indeed made an encroachment on the territory of the Kale Tsaubwa, but this was soon settled. About the middle of the year 924 (A. D. 1562), a more serious attack occurred. The Tsaubwá of Mo-mit reported that some of his frontier villages had been attacked by the Tsaubwas from Ho-tha, Tsánda, and other states eastward of Bamáu. The emperor called a council, and observed he had no doubt but that these Tsaubwas depended on the assistance of the emperor of China, but, as before the destruction of Pugan, all that country was a part of the territory of that kingdom, he should punish this aggression. He sent an army under the three tributary kings of Ava, Prome, and Taungu, and his son, the crownprince. The Tsaubwas then all appeared at Bamau and swore fealty to the emperor. The religious reforms were introduced; pagodas and kyoungs were built, and orthodox phungyis sent, in order that the four monthly worship days and other religious duties might be carefully observed. Times of payment for the royal revenue were fixed, and once in three years the Tsaubwas themselves were to come to the royal feet. Later in the same year, it was discovered that the Tsaubwa of Tanenthari had been sending presents to the king of Siam, and a small force was sent to supersede the Tsaubwa. But the commander was wounded and the expedition was a failure.

The emperor still had his designs against both Siam and Leng-dzeng, but was willing to forego them if the king of Siam would be reasonable. In open court he observed that in the time of the younger brother, (so he now designated Tabeng-Shwé-htí), Siam was a tributary country; that he neither wished for war, nor did he wish to worry his officers and the army; but the king of Siam had four white elephants and ought to present one. This appeared to his ministers and courtiers only reasonable. Messengers were, therefore, sent and the king of Siam was reminded that, in aficient times, his ancestor had presented a white elephant to Wareru, the king of Pegu, to whose rights the emperor had succeeded. The reply of the king of Siam, veiled in ambiguous terms, was interpreted as a refusal, and the emperor determined to march on the capital of his enemy. According to the Burmese history, the army consisted of four great corps, each under one of the three northern tributary kings and the crown-prince. Each corps consisted of 140,000 men, 400 fighting elephants, and 5,000 horses. emperor's own guards under his immediate command consisted of 40,000 men. 400 fighting elephants, and 4,000 horses.* The army was composed measures for attaining the object in view were probably not so mild as is represented in the history.

The Portuguese historian gives no details of the march of the invading army, and, it is probable, did not clearly distinguish the two sieges of the capital of Siam by

of men from all parts of the empire, Pegu, Burma, and the most distant Shan states. The plan of the campaign was for the several corps to march on Zimmé, those starting from Pegu getting as far to the north as possible, and none proceeding from Muttama by the route eastward, which was the route followed by Tabeng Shwé htí in 1548. From Zimmé it was intended that the river should be used to convey stores for the army down to Yodayá, the capital of Siam.

The main army left Hanthawati in November, 1563, and marching up the valley of the Paung-laung River as far as Taungu, passed the eastern mountain range at various points. The several corps were assembled at Zimmé or the neighbourhood, but the king of that country had refused to join the expedition and absented himself. All the places of strength in the territory of Zimmé had to be besieged, though some surrendered on being summoned. The invader thus occupied Thauka-to, Pithalauk, and other cities, and Au-ga-dhammá Rádzá, a son-in-law of the king of Siam, was taken prisoner. Negociations were now opened with the king of Siam, but he refused to come to terms. The invader gradually approached the capital Yodayá, and invested it on all sides. But it was necessary first to get possession of three ships mounted by Portuguese, which were moored in the river for the defence of the city, and were supported by batteries on shore. With great difficulty and loss these batteries were stormed, and the ships surrendered. The foreigners, it is said, were taken into the emperor's service. The king of Siam, disheartened at the loss sustained, now consented to appear before the conqueror, and though he was not required to do homage as a subject, he was dethroned, and his kingdom reduced to a tributary state. The king and his queens were carried off as prisoners and hostages, together with his younger son, styled Brá-rá-ma-thwun. The elder son, styled Bráma-hin, was made tributary king of Siam; the king's son-in-law and other members of the royal family were appointed governors at Pithalauk. Thauk-katé and other cities. These arrangements were made in March. 1564, and the emperor, after making all arrangements at Yodaya, set out with his prisoners for Pegu, where he arrived during the following June. He brought away three white elephants and numerous artificers.

The Portuguese historian, in the 3rd volume of his work, records these events in the following words, in which some errors will be observed: "For the conquest of Siam he led a greater force, possessed himself of the "kingdom, and took the king and his two sons, called by reason of their Bureng Naung, as well as that during the reign of Tabeng Shwé hti, when he was general. The following passage in the third volume appears to refer to the invasion now related: "The war began again between Chaumigrem, king of Pegu, and "him of Siam. The army of Pegu consisted of 100,000 men, among whom were "many Portuguese, and 17,000 clophants. All this army came to ruin."

"different colour, one the black, the other the white. He was content to "leave that king in possession of the crown as his vassal, having himself: been till then his subject,* carrying away his two sons as hostages. "Branginoco returning victorious to Pegu, entered the city in triumph, "many waggons going before loaded with idols and inestimable booty. He came at last in a chariot with the conquered queens, loaded with jewels, at his feet, and drawn by the captive princes and lords. Before him marched "two thousand elephants richly adorned, and after him his victorious "troops."

The emperor, notwithstanding this victory, was dissatisfied that nothing had been done to punish the king of Zimmé for his defection. He had retreated eastward, and was sheltered by the king of Leng-dzeng. Another large army was collected, and among the imperial guard and artillery one-thousand Muhammadans and four hundred Portuguese are mentioned in the Burmese history. The emperor himself left the capital in November 1564, and proceeded to Labong, near Zimmé. A column under Binya Dála, an officer high in repute, took a southern route by Yaháing. All the Tsaubwás of the Yun tribe were anxious to support the independence of the king of Zimmé, but he himself came to the emperor and voluntarily submitted, saying that he did not wish to reign longer. He with his queen and their attendants then followed the emperor's camp. Troops were sent into the country east of Zimmé, to subdue the several petty chiefs.

While the emperor was thus engaged, a rebellion broke out in Pegu, headed by a Shan captive named Binya Kyan, with numerous Shan prisoners, and in which thousands of Talkings joined. They marched towards the capital, and the officers in command there were so alarmed, that they were on the point of sending off the empress and the whole of the royal family to Taungu for safety. They, however, took the advice of the deposed king of Ava, Narapati Tsithu, who pointed out that most of the rebel force were mere unarmed rabble, and might be easily checked. The ex-king was intrusted with a force, and went out and defeated the rebels close to the city. The leader was killed, and the rest fled into the thick woods of the delta. As soon as the emperor heard of this outbreak, he hastened back from Zimmé with a small force, and reached the vicinity of the city in June. 1565. Seeing that all the magnificent kyaungs and other buildings outside the city walls, which he had erected at vast expense, had been burnt by the rebels. he was so enraged, that without entering the city, he proceeded on to Dala to hunt them down. The king of Prome who had accompanied the emperor from Zimmé, was employed on this service; the rebels were utterly defeated. and several thousands of them taken prisoners. The whole of these the

^{*} This apparently refers to the erroneous idea before mentioned, that Taungu . had been tributary to Siam.

emperor intended should be enclosed in a vast temporary building of inflammable materials, and burnt alive as rebels according to Burmese law. The Burmese and the Taláing histories, however, both state that on the intercession of the Budhist monks, Burmese, Taláing, and Shan, he pardoned all except the leaders, and those who had accepted titles from the rebel chiefs.

The emperor's eldest son, the crown-prince, had been left in command in the Yun country, and found great difficulty in subduing the chiefs, east and north-east of Zimmé. At length, they were driven to shut themselves up in Maing-zán, in which also was the king of Leng-dzeng and his family. The town was taken, and all were captured except the king of Leng-dzeng, who escaped in the confusion. The crown-prince leaving his sick and wounded in the town, followed up the fugitives, but the Burmese army suffered from want of food and long marches, and after much loss was forced to return to Maing-zán. The crown-prince then sent to Pegu all who were able to travel, with a report to the emperor of the difficulties encountered. Orders were at once issued for the return of the army, and the crown-prince reached Hantháwati in October, 1565. The queen of Leng-dzeng, and the whole of the prisoners of high rank, were brought and placed in the palace.

The emperor now occupied himself in building new city walls and other public works. The outer wall or rampart was a square of seven thousand yards on each face. There were five gates on each face, each gate being constructed by a tributary king and called after him. A new palace was likewise built, to which the tributary kings contributed materials. The whole was finished in March, 1567, when a grand festival was held.

The last expedition of the emperor against the king of Zimmé appears to be referred to in the second volume of the Portuguese history in the following words: "Then he marched with an army of 1,600,000 men "and overran many neighbouring countries. But another rebellion break-"ing out at Pegu, the queen was forced to fly to the castle, chiefly relying "upon thirty-nine Portuguese, who defended her till the king came and "vanquished the rebels. Then the king sent an officer to bring those men "who had defended the queen to his presence. He brought him some Moors of note. But the king knowing the Portugueses were the men, said in "anger, 'I sent you for men, and you bring me cowards; go, bring me men."

Of this palace the Portuguese historian writes: "He built a palace as big as an ordinary city. The least part of its beauty was rich painting and gilding, for the roofs of some apartments were covered with plates of solid gold. Some rooms were set with statues of kings and queens of massive gold, set with rich stones, as big as the life. He was carried on a litter of gold upon many man's shoulders; the reverence paid him was more like a God than a prince." He called this palace, which was a vast collection of grand pavilions, Kambausa détha after one of the Brachus countries of India.

"The Portugueses being brought, he bid them ask whatever reward they would, and they with the surprise doubting, the king loaded them with "riches, praises, and honours."

In the Burmese and Taláing histories, the Portuguese are not mentioned as contributing to the suppression of the rebellion in 1565. Although it is stated that the officers in command, during the emperor's absence, were utterly bewildered, the whole credit is given to the deposed king of Ava, and to an officer commanding a body of light troops detached by the emperor from Zimmé, and who advanced by forced marches on the capital. But it is evident that in the native histories, the services rendered by the Portuguese are systematically suppressed, and there appears no reason to doubt the truth of the anecdote above related.

The king of Leng-dzeng continued to make demonstrations against the towns in the Zimmé territory held by the emperor's officers. But his son-in-law came in and made his submission. Everything now looked promising. The capital was crowded with people, and was a scene of constant bustle and alacrity. But suddenly rice became scarce, which caused much suffering. The deposed king of Siam became a Rahán, and was permitted to go to his own country to worship. His son Bra-rá-ma-thwun had died, and his widow was allowed to return to Siam with her children. The tributary king of Siam now begun to take measures for once more being independent, and in this was supported by his father. But his brother-inlaw, who was governor of Pithaláuk, would not join them, and leaving his government, came to Hanthawati with his family, where he arrived in June, The emperor saw that another invasion of Siam would be necessary, and began to make preparations. But as the campaign could not commence in the rainy season, he contented himself with strengthening the garrison of Pithalauk and the king of Siam's son-in-law was sent back there. The reigning king of Siam determined to attack Pithalauk at once, and the king of Leng-dzeng appeared with an army to help him. But the garrison resisted all their efforts by land and water. Their force became so reduced, that they at length drew off to a distance.

The emperor had collected even a larger army than before to march against Siam. It consisted of 5,300 fighting elephants, 53,000 horses, and 546,000 men. In the emperor's bodyguard were 4,000 Portuguese, and 4,000 Muhammadans, all armed with muskets, and cannon in great numbers. The army marched in October, 1568, and in forty-seven marches had reached sufficiently near Pithalauk to relieve that place. The old king of Siam who had been deposed, appears to have resumed his position, having thrown off his monk's gown. He had made great preparations for the defence of the city, and his son Brámahin who had resigned power to his father, nobly seconded him. On the upper Menam and its tributaries, the emperor

collected numerous boats to convey stores of all kinds for the army on its march down to the capital. The commander under the emperor was Binya Dala, through whom all orders were issued. A portion of the army remained in the upper Menam to plant rice when the rain began to fall, in case there should be a scarcity lower down. The army invested the capital without any resistance. The emperor had determined to reduce it by famine. But after four months, that is, in May 1569, little or no effect had been produced. At this time the old king of Siam died, and his son Brámahin made some overtures for surrender, but these were not accepted. The losses in the Burmese army had been very severe, and the emperor becoming anxious, put two of his superior officers to death for neglect of duty. At this time, the king of Leng-dzeng approached with an army to relieve the capital. The emperor leaving Binya Dala in command, himself proceeded with the crown-prince and other officers, and a battle was fought in which the Laos king was defeated. The king now returned to renew the siege. Affairs had become very serious and the emperor had recourse to a stratagem. One of his Siamese supporters, a noble of high rank, pretending to desert, entered the city with irons on his legs. He was received with joy by Bramahin, and appointed to a high command. In pursuance of his treacherous design, he maintained a correspondence with the emperor, and opening one of the city gates allowed the enemy to enter. The city was taken in August, 1569, after a siege of seven months. It was given up to plunder The unfortunate king Brahmahin was made prisoner.* The emperor remained in the city of Yodaya for two months, and appointed Tháung-kyi, a member of the Zimmé royal family, tributary king of Siam. In a council of all the principal officers, it was decided, that it was now essential that the king of Leng-dzeng should be followed up. Sending back all surviving disabled men to Pegu, and an immense quantity of plunder, the emperor himself proceeded up the Menam, and fixed his head quarters at Pithalauk. From thence the several divisions of the army marched eastward. After a long and tedious march, the emperor encamped on the right bank of the Mekong, opposite Máing-zan. Nothing had been heard of the corps commanded by the crown-prince and other generals. Orders were issued to fell trees, to prepare boats and rafts, to cross the river. A bridge of boats was at last made by which the army passed, and the enemy deserted Máing-zán. The other divisions, after great sufferings, had crossed the river some distance to the north, and now marched down to join the emperor. Máing-zán being made a depôt for stores and the sick, the king of

[•] Nothing more is said of this king in the Burmese history. Both that and the Talaing history dwell on the death of the old king and of the generosity of the conqueror in giving him a grand funeral. His son, it would appear, committed suicide, as we learn from an old Venetian traveller quoted hereafter.

Taungu was left in command, while the rest of the army under the emperor marched in pursuit of the enemy. The Leng-dzeng king was too wary to come to an engagement, and the invaders were wearied with long marches and want of food. At length, they returned to Maing-zan, and the whole army re-crossing the Mekong reached Pithalauk, in June 1570.* From thence the emperor reached Hanthawati in the following month. Of the original army which marched to subdue Siam, very few survived.

The emperor's first care after his arrival was to make rich offerings to the pagodas; to cast fresh images in precious metals, and to complete a new Hlwut dau, or royal council chamber, within the palace. He had turned his attention to foreign trade by sea, and built a ship of his own, which he sent loaded with merchandize to Melaput (?) and other ports of Ceylon and Southern India. In 1571, a rebellion of the northern Shans of Mo-gaung and Monhyin occurred. A force under the crown-prince and the king of Ava was sent against them; but the Tsaubwas could not be found, and the army was recalled. During this interval, the king of Leng-dzeng for some unexplained reason made an attack on a city belonging to Cambodia,† and was killed. One of his nobles usurped the throne. But the emperor, who had the deceased king's brother, named Ubarit, at his court, determined to support his claim, as he consented to become a tributary. An army was sent under the great general Binya Dala, to place him on the throne, but the expedition was unsuccessful. He was either put to death or sent into exile to a sickly place where he died. Binya Dala appears to have been a native of Pegu, but probably of Shan descent.

The last expedition of Bureng Náung against Siam, and afterwards into Laos, is related by the Portuguese historian in such a manner, that he appears to assert that the city of Yodayá was not taken. The fact of its surrender, however, admits of no doubt, though from the great loss sustained by the besiegers, it probably would not have fallen, had it not been for the treachery which has been related. De Sousa, after relating the capture of the Siamese princes in the first siege, but apparently not knowing that their father, the senior or first king of Siam was carried off as a hostage, proceeds thus: "After some time, the two brothers asked leave of the king to visit "their father, which he granted, and afterwards sending to demand the usual

- This is probably a mistake for June, 1569, as will be seen farther on.
- † Cambodia is called in the Talking history 'Khameng,' probably a corruption of the native name Khmer. Cambodia seems to be the Portuguese form of Kamphoutche, which itself is probably derived from Kambauza, the name of an ancient Budhist country of India. All the Indo-Chinese nations have been in the habit of calling their cities after famous Indian cities. A portion of the Shan country was also called Kambauza, and the country east of Bamáu was named Kosambi, which in popular language has been changed to Ko Shán pyí. Yodayá, the capital of Siam, is the Indo-Chinese form of the famous city of Ráma.

"tribute, the black Prince refused to pay it. The king in a rage sends his "great favourite Banna, with a powerful army against him. Banna rayaged "the country of Siam, and besieges the Prince in Hudixa, who defended it "so bravely, that Banna being forced to draw off, he fell upon and totally "defeated him. The king sends his brother-in-law with a greater power, and "he receives a greater overthrow; 200,000 of his men were cut in pieces "with a great number of elephants and horses, many more of both taken. "The black Prince remained victorious, his men were enriched and all en-"couraged to follow their good fortune. The king of Pegu raises another 'army of 1,700,000 men, 1500 elephants, 80,000 horses, and all necessaries "proportionable. The command of it he gave to Mapa Raja" his son, with " the title of king of Siam, not doubting of the victory. At the news of this "power, all Siam trembled except the valiant black, now king, who met his "enemy and gave him battle. The two kings encountering on their ele-"phants fought, and he of Pegu was cast dead off his elephant, at which "sight his men fled and the Siamites pursued them a month, destroying the "greatest part of that vast army."

This account seems to mix up the three or rather four separate expeditions which we have given from the native histories. The first against Yodayá, where, though Bureng Náung was victorious, it was with immense loss; the two expeditions into Leng-dzeng, the last being under Binya Dala and both unsuccessful; and that, to put down the insurrection of the northern Sháns, under the crown-prince, which was also a failure.

Some light is thrown upon this period of the history by the narrative of Master Cæsar Fredericke, the Venetian, who, as translated in Purchas, states as follows:† "Sion, or Siam, was a great city, but in the year 1567, it was "taken by the king of Pegu. The number of his army was a million four hundred thousand men of warre. I was in Pegu six months after his departure, and saw when that his officers that were in Pegu sent five hundred thousand men of warre to furnish the places of them that were slaine and lost in that assault. Yet for all this, if there had not been treason against the citie, it had not been lost; for on a night there was one of the gates set open, through the which with great trouble the king gate into the city, and became governor of Sion; and when the emperor saw that he was betrayed, and that his enemy was in the city, he poisoned himself; and his wives and children, friends and noblemen that were not slain in the first affront of the entrance into the city, were all carried

[•] This means Upa Rádsá—the Yuvaraja of the ancient Hindus,—which was the title Bureng Náung conferred on his eldest son. It is equivalent to Ein-She Meng of the present day.

[†] Casar Fredericke, seems to have been in different parts of Pegu during 1867,
1868, and 1869.

"captives into Pegu, where I was at the coming home of the king with his "triumphs and victory; which coming home and returning from the wars, "was a goodly sight to behold, to see the elephants come home in a square, "laden with gold, silver, jewels, and with noblemen and women that were "taken prisoners in that city."

It will be remarked that there is a difference of one year in the date given in the Burmese history, and that by Cæsar Fredericke as to this invasion of Siam. The difference is extended to the date of "the coming home. of the king," which the Venetian traveller apparently places in 1569; and the Burmese history in 1570, after the conclusion of the expedition into Leng-dzeng.

Cæsar Fredericke visited Martaban where, as he states, "we found ninety "Portugals of merchants and other base men, which had fallen at difference "with the Rector or governor of the citic. At that time, the city was "empty of men, by reason they were gone all to the warres, and in busi"ness of the king."

He then proceeded to Pegu, "which are two cities, the old and new. "the old city are the merchant strangers, and merchants of the country. "The merchants have all one house, or Magason, which they call 'Godon,' "which is made of brickes, and there they put all their goods of any value. "In the new city is the palace of the king, and his abiding place with "all his Barons and Nobles, and in the time that I was there, they "finished the building of the new city. It is a great city, very plain "and flat, and four square, walled round about, and with ditches that "compass the walls about with water, in which ditches are many crocodiles-"It hath no draw-bridges, yet it hath twenty gates, five for every square, "on the walls. There are many places made for centinels to watch, made " of wood, and covered or gilt with gold. The streets thereof are the "fairest that I have seen; they are as straight as a line from one gate to "another, and standing at the one gate you may discover the other; "and they are as bread as that ten or twelve men may ride abreast in them. "And those streets that be thwart, are fair and large. The houses be made " of wood and covered with a kind of tiles in form of cups. The king's palace "is in the middle of the city, made in form of a walled castle, with ditches "full of water round about it. The lodgings within are made of wood, all "over gilded, with five pinacles, and very costly work covered with plates of gold." The whole of this description of the city of Hanthawati, and of the palace, would answer for the present capital Mandalé, except that the streets of the latter are broader than is here indicated, and that the palace wall has no ditch. The traveller gives an intelligent description of the army of the king of Pegu; of the war elephants; the "good ordnance made of very good metal;" he hath "eighty thousand harquebusses, and the

number of them increaseth daily;" the rest of the soldiers are armed with bows and arrows, pikes and swords, "but their armour and weapons are very naught and weak;" this was compared with the European armour and heavy pikes of the period. The account given by this observant traveller shows that the native histories do not exaggerate his power and magnificence. Indeed, they state the number of his soldiers much below that given both by the Portuguese historian and the Venetian. The latter concludes this part of his narrative by stating—"The king of Pegu hath not any army or power by sea, but in the land, for people, dominions, gold, and silver, he far exceeds the power of the great Turk in treasure and strength."

The traveller also describes how "the king sitteth every day in person to hear the suits of his subjects," he sitting "up aloft in great hall on a tribunal scat, with his Barons round about;" while on the ground "forty paces distant" are the petitioners "with their supplications in their hands, which are made of long leaves of a tree," and a present or gift according to the weightiness of their matter." If the order be favourable, "he commandeth to take the presents out of their hands; but if he think their demand be not just or according to right, he commandeth them away, without taking of their gifts or presents." So the pitiless Bureng Náung had a conscience, when sitting as a king to hear his people's complaints.

The Taláing history records that the emperor desired another expedition to Leng-dzeng, to retrieve the last disaster there, and "destroy the head and not the mere tail of the cobra." The levy of an army was commenced, but the people murmured loudly, and many were heard to say that it was better to die at home than to perish of hunger and fatigue in a far country. The Shans were equally discontented, and some of the Tsaubwas, it is said, were supported in their opposition by the emperor's half brother and son-in-law, the king of Ava. The project was deferred for the present, but in 1574, the emperor determined to place Ubarit on the throne of Leng-dzeng. He marched in October of that year, and arriving at Máing-zán, laid in stores of grain. He did not march into the country, but issued a proclamation that he had come to place the rightful heir upon the throne. He then bestowed, the regalia upon Ubarit with much good advice, and departed, leaving his tributary at Maing-zan with some troops. He reached Hanthawati in May, 1575. But a new expedition against Mogáung and Monyin had now become necessary; for those restive states had refused to join the last expedition to Leng-dzeng, and were in open revolt. A force directed by the emperor himself proceeded north from Ava. The Tsaubwá of Monyin was killed, but the other fled, and though the troops followed him into regions where there was only snow for water, they could not capture him. In Leng-dzeng, however, the course of events was more fortunate. The usurper was delivered up by his own officers, together with his son, and the

Burmese commanders, apparently glad to leave, returned at once with their prisoners to Zimmé. There a portion of the force remained, and the remainder came on to Hanthawati. These important prisoners were forwarded to the emperor who was still at Mogaung, as the exhibition of them in that quarter would, it was considered, have a good effect. The Tsaubwa of Mogaung, however, could not be caught, and the emperor, recalling his son and other officers from the pursuit, returned to Pegu, and reached his capital in July, 1576.

There a great triumph awaited him. The emperor had long been in communication with ports on the coast of India and with a Budhist king in Ceylon. He was the most powerful protector of the three treasures in Indo-China, and his support was naturally sought for by the now petty rulers in the holy island of Budhism. Two years before, a Singalese princess had arrived and had been received with high honour, though the Portuguese historian asserts that the lady sent was only a daughter of the chamberlain of the king of Colombo. Now, at the very time the emperor returned to his capital, news was brought of the arrival of the holy tooth relic of Gautama Budha in a ship at Bassein. As the season was unfavourable for the ship to come to Pegu, a deputation of all the nobles of the highest rank was sent, and they bore a golden vase, adorned with the richest jewels taken from the conquered kings, in which the precious relic was to be deposited. A letter was also received from Dhammapala, the king of Ceylon, announcing that he was the only orthodox king of the four who ruled in the island. Arrangements were made for building a suitable pagoda for the reception of the relic; and with reference to Dhammapala's complaints of his being rather overborne by the three heretical kings, an envoy with a small force selected from all the various races in the emperor's army, was despatched by sea to Ceylon. This, it is intimated, had the effect of causing the Budhist king to be much respected, and the envoy then returned.

The Portuguese historian places the arrival of the pseudo-princess and the pseudo-relic at the same time, but otherwise his statement appears substantially correct. It is as follows: "Among the treasure lately taken from the king of Jafanatapan, was an idol adored throughout all the coast of Asia, and so highly esteemed by all those princes, particularly the king of Pegu, that he every year sent ambassadors with rich presents to get a print of it." The king of Pegu hearing that the Portuguese Viceroy had this idol—the tooth relic—, offered 300,000 ducats for it. This was refused, and the tooth was beaten to dust in a mortar and burnt at Goa, by order of the Viceroy Don Constantin. "All men," adds de Sousa, "at that time "seemed to applaud the act; but not long after, two teeth being set up "instead of that one, as shall be related in the government of Don Antony "de Noronha, they as much condemned and reviled at it," As to the

Princess, the Portuguese historian relates—"Brama, king of Pegu, being told "by astrologers that he was to marry a daughter of the king of Colombo, sent "to demand her, and he had never a one; but his chamberlain had one the "king esteemed as his own." He agreed also to give the tooth in dowry with the bride. They were received "with the greatest pomp that ever has "yet been heard of. Many gallies were fitted out, but that which was for "the queen, was covered with plates of gold, and rowed by beautiful young "women, richly clad, and brought up to this exercise. The king of Candea " understanding the deceit of this marriage, and envying that great fortune, "acquainted Brama* therewith, offering him a true daughter and tooth, "and affirming both that of Columbo, and the other of Don Constantin "were counterfeit, and the true one was in his hands." Nothing of this is to be found in the Burmese or in the Taláing history; the relic, though received with much pomp, disappears from history, and from the memories of the Budhist nations, where, if believed in, it would have been enshrined for ever. It was deposited in the relic chamber of a Zedi built to receive it, and in which gold and jewels of such immense value were placed, that the Zedi was probably broken into, and the relic chamber plundered, in the time of the Portuguese adventurer, Philip de Brito, about twenty-five years later.

After the acquisition of this relic and, it is inferred, from its good influence, the Tsaubwá of Mogáung was surrendered by his chiefs to one of the emperor's sons, styled Thá-yá-wati Meng, who had been sent with a detachment into that country. The young chief was brought to Hantháwati, and the emperor reproached him with his ingratitude, after the kindness with which he had formerly been treated. His life wss spared, but he was exhibited at one of the city gates in fetters for seven days, after which he was released. About one hundred of his followers who had supported him in his gallant resistance, were sold as slaves to Kulá merchants, and being put on boardship were sent beyond sea. The emperor had thus rid himself of his most troublesome enemy, but affairs in Leng-dzeng were not satisfactory. To strengthen his position in that quarter, he now appointed his son, the Thá-yá-wati Meng, who had shown great energy and ability. tributary king of Zimmé. He left for his kingdom in March, 1578, and the emperor enjoined him to remember that he owed allegiance to his elder brother the Upa Rádzá. He received the title of Náurahta Dzáu. But the emperor, from the anxious care he took to bind the two brothers together. seems to have foreseen the danger of future struggles among the tributary

^{*} Brams was the usual Talsing pronunciation of the national name for what we now style Burms, or as now written by the Burmese, Mramms and Bams, but originally Brahms. Bureng Naung, as already explained, claimed to represent the ancient Burms race, and is thus correctly designated by the Portuguese historian.

kings of the empire he had founded. It was again necessary to send an army into Leng-dzeng. A pretender had appeared claiming to be the dead king Bya-tsétsít, and Ubarít was unable to meet him in the field. The Upa Rádzá set out in October, 1579, and marched to Máingzán where Ubarít joined him. The expedition was successful, and the crown-prince returned to Pegu in the spring of 1580, bringing some prisoners of importance.

The emperor had now subdued all the enemies with whom he had fought for so many years. Even Leng-dzeng was to a considerable extent subject to his tributary king. Instead, however, of resting or granting his subjects relief, he turned his attention to Arakan. The king of that country, he observed, desired to be independent, contrary to his engagement, and it was necessary to coerce him. A large fleet of vessels and boats of all sizes were collected, in which an army of eighty thousand men was embarked, and the fleet proceeded to a point on the south coast of Arakan, where the men landed and marched to Thán-dwé (Sandoway) in November, 1580. The force was commanded by one of the emperor's sons, who received the title of Thirithu-dham-má Rádzá. He entrenched himself at Thándwé. and awaited further orders as to an advance on the capital of the kingdom. This expedition is noticed by the Portuguese historian, who states that a ship belonging to the king of Pegu was loading at Mazulapatan. The governor sent some ships to seize it, on what account is not stated. They did not encounter it there, but afterwards near the mouth of the river Negraes, and there sunk it. Near this, they met the Prince of Pegu with a fleet of 1,300 sail, designed for the conquest of the kingdom of Arakan. A fight took place, the Portuguese disabled and took some of the enemy. but were obliged to withdraw, on account of the great number opposed to them, and got into the port of Arakan. The Portuguese then considered themselves at war with the emperor of Pegu, which probably resulted from his interference with the petty kings of Ceylon. In the native histories no notice is taken of this attack on the Burmese fleet. The army sent by the emperor seems to have remained inactive at Than-dwé for nearly twelve months. In October 1581, reinforcements were sent, but these did not go by sea. The emperor's days, however, were numbered, and before the whole of the reinforcements reached their destination, he died very suddenly in November, aged sixty-six years, and after a reign of thirty years in Hanthawati. There is a studied obscurity in the native histories as to the lineage of Bureng Naung, but as he had in early life married a sister of king Tabeng Shwe hti, it is probable that he belonged to the royal family of Táungu.

No. 33.

List of the Kings of Pegu of Shan race, who reigned after the re-establishment of the kingdom under Waré-ru, A. D. 1287.

	Co Eo Eo Eo Eo Eo Eo Eo Eo Eo Eo Eo Eo Eo	Commencement of reign.	nent .	rgior 1 .e	เดออก	
Names or titles of Kings.	Year of religion.	v. d.	osomrust .gre	o dygnad areay ni	enoiteloH nu Aono gara Yari	Вемлеко.
			Ņ.			
Wa-ré-ru,	:	1287	649	19	:	A Shan chief who established the dynasty.
Khun lau. or Thana ran bya-keit,	:		899	4	Brother.	but had his capital at Muttama.
Dzśu-śu, or Theng-mháing,	:	:	672	13	Nephew.	
Dzau-dzip, er Binga-ran-da,	:	:	685	_	Brother.	
Birya-6-lun	:	:	697	18	Cousin	Son of No 2, Khun-lau.
Binya-ú, or Tsheng-phyú-sheng,	:		210	37	Consin,	Son of No. 4, Dzán-dzip. This king restore
Binya-nwe or Ra-dza-di-rit,	i	:	747	æ	Son	the ancient capital Pegu.
Binya Dham-má Ra-dzá,	:	:	785	က	Son.	
Binya Rén-kit,	:	:	788	ន	Brother	
Binya Wa-rú,	:		808	4	Nephew	
Binya Keng,	:	:	812	တ	Cousin.	
Mbku-dáu,	:	:	815	:	Cousin.	Reigned seven months.
Sheng-tséu-bu, Binys-dén (Queen),	:	:	816	-	:	Daughter of No. 7, Kadza-di-rit.
Dham-má Dzé-di,	:	:	822	31	:	Not of royal race.
Binya Ban,	:	:	853	32	Son.	Son.in-law of No. 13, Shengtsku-bu.
Ģ,	:	1526	888	14	Son.	Conquered and deposed by Tabong Shwe hti,
	•					king of Tsungu, A. D. 1540.

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Notes on the age of the ruins chiefly situate at Banáras and Jaunpur.—By the late Mr. Charles Horne, B. C. S.

The following notes refer chiefly to the ruins at Bakharyá Kund at Banáras, full accounts of which have appeared in the Journal of the Asiatic Society of Bengal for 1866, and those at Jaunpúr, viz., the three great mosques of Atálah-Lál Darwázah and the Jámi' Masjid; although a large portion of them will apply to many other buildings in this part of India.

Up to the winter of 1870, I had always believed, and my belief had been strengthened by the opinions of others, but these buildings had in general been built upon Buddhist or ancient Hindú substructures, or had been altered and converted from such buildings for Muhammadan purposes. They had been so treated by the Rev. M. A. Sherring and myself, when describing them, and General Cunningham, Archæological Surveyor of India, appeared to be of the same opinion. Thus these substructures would date very early, even to 300 and 500 A. D., at least.

My attention to the subject of this alteration and conversion had been first aroused by Mr. Fergusson's admirable account of such conversion, and most of these buildings shew traces of such alteration. But happening to refer to Mr. Fergusson's History of Architecture, Vol. II, page 663, for a description of Indian Saracenic Architecture, the edition now used by me being of a later date than that I possessed before the meeting in 1857, I find that the writer, speaking of Bakharyá Kund near Banáras, says, that "there is a singular group of tombs and other buildings by the Moslems which are singularly pleasing specimens of the Jaunpúr style."*

In the upper part of the page, there is a description of the grand old Atalah Mosque (العالم) at Jaunpur, in which Mr. Fergusson says that he was "almost inclined to agree with Baron Hügel in considering this a Buddhist monastery." I have lived five or six years in the immediate vicinity of all these buildings, and have examined them most carefully and duly weighed all the evidences of antiquity I met with, and I entirely agree with Baron Hügel in holding that much of the substructure as well as the general plan is Buddhist or Ancient Hindú. If so, they are most interesting examples of their class and built examples of an ancient style which Mr. Fergusson holds not to exist in India at the present time. Hence the subject assumes great interest, and is worthy of careful and temperate discussion. Unfortunately, to be properly dealt with, it requires many plates.

In two manuscript copies of the Jaunpurnamah, of 'History of Jaunpur,' which I have compared, and which was compiled some seventy years

In a footnote to the same page we find :—Journal of the Asiatic Society of Bengal, for 1865 (should be 1866). There however, they are mistaken for Buddhist remains, which they are not."

since by Khairuddín Iláhábádí, a most learned Muslim of the city, from manuscripts and from local oral tradition, the Atálah Masjid is spoken as an existing idol temple when Fírúz Sháh founded the city. In this record we are told that Rájah Jay Chand overcame the giant Karabir, who resided at Jaunpúr, and destroyed an idol temple; but this temple would seem rather to have stood on, or below, the site of the Fort of Jaunpúr, and of it but few traces remain. These consist of carved stones built into the mosque, which was afterwards constructed chiefly thereof in the Fort area.

This view is supported by the fact that, in 1858-59, when mines were drawn under the fort for the purpose of destroying the fortification, carved stones and fragments of friezes were dug out, of the same patterns as those used by the Muslims in their erection of the propylus of the mosque of Atalah. This fort dates (as a fort) with the bridge, or perhaps a little earlier, i. e. the latter part of the 15th century. The temple of Atalah Devi, or Dewal Atalah, is spoken of throughout the history as having been a place of great sanctity, and it would seem that the Brahmans on the overthrow of Buddhism had appropriated it, and making Sakhya Muni the ninth Incarnation of Vishnu, left his figures standing therein. The fact of there being such figures, many remains of which still exist, only proves that the monastery was built after the faith had become much degenerated. Fírúz Sháh granted the people a sanad whereby their temples were not touched, but no new temples were to be erected. Subsequently, we are told, that naturally, as the Muslims gained power, they converted it into a mosque, and it became the state place of prayer; but subsequently falling into disrepair. it was never restored.

This, remember, was written by Muhammadans who could have no possible object in misrepresentation, and who, if it were so, would certainly claim the mosque as an original erection.

When most carefully examined by me, I found no traces of statues of any other than Buddhist, i. e. Sákhya, at the Atálah, although some others were found built into the other mosque. In the basement niches there would appear to have been cut in relief bells supported by chains or twisted rope. This is a well known form of ancient Hindú ornamentation, and the cloisters at the Qutb near Dihlí, which Cunningham so clearly shews to have been constructed of Hindú temple pillars, are covered with them. Report for 1862-63, page xxxix.

This last named writer in one place speaks of the apparent conversion of these bells most ingeniously into seal and stands with a Muhammadan inscription upon them, and this would appear to have been done at the Atalah, notably in the vestry room, converted by them into a room for their women who entered by a private door and staircase, and they then appear to have cut upon the said seals their profession of faith.

Again, the brackets within the courtyard which supported the eaves of the upper cloister have originally been animals. Their forms have been defaced, but it cannot be concealed, and surely no Muslim ever put these up. Throughout the three mosques at Jaunpúr there are built into the restored or altered parts, such as the gateways, and domes, very many defaced Hindú figures, chiefly Buddhist, built face inwards into the masonry, all shewing most plainly whence the materials were obtained.

The Maháwanso tells us that the pulpit in Buddhistical Viháras always faced the East, and that the principal door faced the East also. Hence the direction of Makkah was already arranged for.

The great porch of the Jaunpur mosques may be entirely of Muhammadan construction; but the principle of the arrangement of the doorway is very ancient Hindu, whereby the light enters from over the high door and falls at a certain hour on the figure of Sakhya, which was always placed upon a 'singhasan,' or throne, facing due East.

The cloisters around appear to be much as they ever were, excepting that they have been constantly repaired, and pillars here and there replaced. I have never heard of such pillars being claimed by Musalmáns; and we find the same at the rock cave temple in Bihár, whilst the cruciform capitals are as ancient as any form of Indian architecture that I know of.

The centre gateways are manifestly inserted, and although ancient materials have been used, the work is Muslim. Here any unprejudiced person can see at a glance how the ancient work has been overlapped and built in. He has only to look at the columns and at the ground basement moulding running under the very steps. This basement moulding appeared to Mr. Sherring and myself to be part of the original building, and here I may remark that the Muhammadans, when preparing a mosque, never cared to disturb the good old foundations or the basement moulding. They built on whatever they found that suited their purpose, and hence we find mere ancient substructures.

As doubtless the masons employed by the Muslims were Hindús, any mason marks made by them during the rearrangements would prove nothing. They are not therefore quoted in this place. Some were published by me in the 'Builder,' of June 26th, 1869.

The cloister pillars also shew beneath the new work of the porch, which is scaling off and falling down.

The whole country in this neighbourhood was formerly covered with ancient temples, and we found in the foundation under the front gateway

of the Lál Darwázah a Hindú pillar carved over with chains and bells. The fact that Jaunpúr, under some other name, is not mentioned by the Chinese travellers is not surprising; for, as I said before, the whole country is covered with the remains of such buildings, and they had enough to see and describe without going out of their way.

Before leaving these interesting buildings, I would wish to remark a curious coincidence. The "Sita-ka-Rasui" at Kanauj is quoted by Mr. Fergusson from Cunningham's Report as having been rearranged from a Jain temple by the very Ibrahim Shah of Jaunpur in 1406, A. D., i. c. just the same time as that assigned by that gentleman (viz., A. D. 1419) for the erection of the Jaunpur mosque by Ibrahim Sh.h. The inference is very clear. He says that they were commenced at this time, and finished by Husain, 1451-78.

In all this, I do not deny that the Muslims may have copied ancient patterns in carving, as is notably seen in old cloisters in the Fort at Rajghát, Banáras, the adaptation of which has never been disputed, and they certainly used carved stones found on or near the spot for their new work. Mr. Fergusson writes to me that our difference of opinion is not one of degree, it is absolute; "I deny in toto that these mosques are built on Bud-"dhist sites, or that their details are Buddhist, or even copied from Buddhist buildings."

The closed cells under the courts are not wanting, and are visible in a marked degree under the Mosque of Aurungzeb in the centre of Banáras, where all may see them.

The very many ancient carved stones found within the precincts of the mosques prove that at the best they were sites of buildings of great antiquity.

I will now say a little relative to the ruins of Bakharyá Kund and the grounds upon which we (Mr. Shering and I) assigned them the date we did, viz., that of the Gupta dynasty, according to Mr. Fergusson, 300 to 400 B. C.

At Jaunpur, I am not aware of any inscriptions having been found to fix the conversion of the mosques; but at Bakharyá Kund we were more fortunate, and the reader will find one of the time of Firuz Sháh, A. D. 1375, quoted by Mr. E. Thomas in his work on the Chronicles of the Pathan kings of Delhi, to shew how they appropriated and built upon temples which came to their hand. In fact, I may in passing remark, that I have only found one temple at Banáras which can claim date before the time of Mahmud, the destroyer of temples. It is at Khundúa on the Pachkosí road, and is well worthy of the visit of any passing archeologist.

The Chinese traveller of the 7th century, Hwen Thsang, mentions many Buddhist monasteries at Banáras in his day, and states that there were thirty, to most of which were probably attached temples, and considering the mention structure of the day, I hold that some remains must exist even now. Hence Mr. Sherring and I examined well the line of country where they were

likely to be, and we reported our success in the pages of this Journal. Chief amongst these was the one at Bakharya Kund, which Mr. Sherring brought to notice some years ago. Here we found a small mosque, the substructure of which we hold to be original ancient Hindú or Buddhist There were also many terraces, girt at their base with massive mouldings, breast works built up of large cut stones, low cloisters constructed of old square columns, and foundations built of huge brick and very many feet in thickness (10 to 30 ft.). Over the ground were scattered carved stones, broken statues, kulsis or top stones, 9 feet in diameter, with many other remains. Below these basement mouldings or blocks of stones, squared on three sides and rough internally, which had been laid bare by the weather, were many incised inscriptions in the Gupta character. A few of these have been collected on the accompanying plate, and these have principally, but not wholly, been object from stones 'in situ.' This is one of the principal grounds of our opinion, which was not hastily formed. The inscriptions were kindly translated for me by my learned friend Babu Rajendralala Mitra.

The small mosque is a very curious one of conversion, if it be one. The ground plan is not that of a mosque at all, but of an Indian temple. It is a square with a square projected on each face. On that facing the East, however, the projection has not been carried out, but instead an enormous stone has been let in as a base for the singhásan on which was to stand the figure of Sákhya. From the base arise pillars, severe in character, square as all the ancient Hindú pillars were in this part of the country, whilst above the Muslims have put on a dome. It has been figured in our account in the J. A. S. for 1866, and even struck J. Prinsep who lithographed it in his views of Banáras. The massiveness of the pillars, which are built up of single stones without mortar, has ensured permanence.

Other remains near are held by us to be of equal antiquity. These have been preserved by being used as tombs for the burial of great men or of saints. With the wealth of material lying about, the Muslims of Banáras appear seldom to have built a tomb, but at Jaunpúr there are most elegant mausoleums in which little or no Hindú materials have been employed.

The strange way in which pillars have been used as architraves at Bakharyá Kund is very singular, but the height of absurdity was at Sayyidpur Bhitari, a great Buddhist site, where I saw a linga put up for a Muhammadan head stone at a grave, with a little niche for the lamp cut in it, and this linga had been carved out of a Buddhist column. After this, one can wonder at no amount of conversion or alteration by the Muslims.

I trust that in the above notes I have shewn some ground for the views I hold in regard to the buildings, the date of which is under discussion, and I would beg to refer the reader to the ample details in this Journal for 1868.

Studies in the Grammar of Chand Bardai.—By John Beames, B. C. S., &c.

As the first fasciculus of the text of this ancient poet has now been published, it may be hoped that scholars in various parts of India will begin to co-operate with those few persons who have hitherto had access to the MSS. in elucidating the mysteries of his crabbed and archaic style. The time seems opportune, therefore, for collecting such observations as I have been able to make from time to time on the grammatical peculiarities which Chand's language exhibits. I have not been able to study the whole of the vast work, indeed such a task would take up all the time of more than one student even if he were not like me much occupied with official duties; but as the style, even in its irregularities, seems to be uniform throughout, notes on those books which have been examined, will probably be found applicable to the rest. The illustrations hereinafter given are taken chiefly from the 1st book as it is now in print. The 19th, 64th and 65th books, have also been cited. There are, moreover, several quotations from various parts of the first eighteen books, and one or two from the 21st, the celebrated Mahoba Khand.

By way of getting at a sound working basis, it is necessary first to clear out of the road certain obstructions partly peculiar to Chand and partly shared by him with all early Indian poets. The first of these is the uncertainty of the spelling, in respect of vowels, we find the same word written at one time with a long vowel, at another with a short one; vowels are inserted or omitted at will, and diphthongs are written in two or three different ways. In respect of consonants, arbitrary insertions or omissions occur, double consonants are written as single, and single as double, aspirates are deprived of their aspiration, and unaspirated letters are aspirated at will. The following examples may be taken:

a. Vowels नार and नारी; वात, वत, वत and वत, वकास and वाकास; वेशि and वेशी; रिव, रिव, रिव and रिवी (विव); तिर and तिरि; पुज, पूर्वा, and धूम; इनायं for दांत or दन; सेश, स्वस, सर्थ, सेश्वर(सेश); जी, ज्वयं, and जवन; तिरि, तिरी, तवरि, and तवरी; नगर, नयर, नर and नेर; मुख, मुझी and पूर्वी; मुझियो and मुखी; मनुव, मानुब, मानव and मनव; सेति, सेती, सेति and सेता; के, जब, जर and जवा; विनस्ताया and विनासा; रक, रक, रकव, रिव and रख, दो, दुर and देवा.

b. Consonants. पडकर, and बाबर; चारी, चारीन, चारीन and चान ; क्यी, and बीं। चींप and चींच; बारज and चाज also फज्जड़ चित्र and दिन्ध; चेंच and बाद; चाचरिका and चायरज; तुप, तुर्च, and तुर; पुण and पुत; चार्च, क्या, जांचा बाद वींचाड़; कार्य वांचा, and चावा, कार्य चावा, चावा, कार्य चावा,

,

22

X,

Two explanations suggest themselves for this state of things. In the case of alterations which affect the metrical quantity of the syllable, we may suspect that they had been made *metri causa*, as is customary in Hindí poetry; and in those which do not affect the quantity, we can often see various forms of the same word in successive stages of phonetic corruption.

But those two explanations do not account for every change, nor is all yet explained, even if we add the ignorance or carelessness of copyists. Moreover, we are led to be very shy about using the *metri causa* argument from observing the extreme laxity of the poet in this respect. Looking at his metres simply according to the name they bear, we may divide them into three classes:

1st. Those identical with Sanskrit metres.

2nd. Those peculiar to the poet.

3rd. Those identical with modern metres.

Leaving out the second as indeterminable at present, if we take the first and third we find that by no process can we make them scan. We may indulge to the full in the liberty of inserting or omitting the unwritten short a, we may pronounce diphthongs as one, two, or three syllables, but not even thus can some of the lines be brought to accord with the scale. Sometimes ten lines will scan quite accurately, and the eleventh be all wrong. The bards of the present day call Chand's style the 'dingal bhākhā,' as contrasted with 'pingal bhākhā,' or verse constructed according to strict rules of prosody. It must be remembered that many of these poems were impromptu productions, and most, if not all, were written to be sung, and any deficiency of syllables could be covered by prolonging one sound over two or three notes, as often happens in English songs, or on the other hand two or more syllables could be sung to one note as in our chanting. Where so much license exists, we cannot use the metrical argument except with great caution.*

We are, therefore, driven back to the conclusion that in Chand's time the form of words and their pronunciation was extremely unfixed. This is probable from historical considerations also; and the use of the conclusion itself to us in our present enquiry is that it removes out of the way the necessity of attempting to establish a fixed set of forms for words and inflexions. We take all Chand's words for the present as they stand, we take each word in four or five different forms if need be, and do not trouble ourselves to find out which is the right form for Chand's period, simply because we do not believe there was any right form, any one form, that is, more used and more generally accepted than any other. In fact, we

* Since writing the above, I have been informed by Dr. Hoernle that he does not find Chand's metres so irregular as the bards report, but the learned professor allows himself to alter the spelling of the text to bring the words into agreement with the metres, a practice which seems somewhat premature.

recognize the thoroughly transitional character of the language we have to deal with.

The second obstruction to be removed is that of texts; so far as I have seen, the MSS. at present available, some five in all, have all been copied from the same original text, and servilely repeat the old mistakes. Where they differ from one another, we can generally detect merely an additional error of the copyist. It is not necessary therefore to enter upon a detailed collation of texts, such a process would not lead to our finding out or establishing one settled and correct reading. Sometimes for thousands of lines together, there is not the divergence of a single letter between the whole five MSS., the same obvious errors being faithfully repeated by all. Historically the Baidla MS. has the best right to be considered the representative of the original text. Tod's and Caulfields' MSS. belonging to the Royal Asiatic Society, were made for the officers whose names they bear in the second decade of the present century, as stated in the colophon to each, though it is not stated from what older MS. they were copied. The Bodleian has no colophon, but agrees, as far as I was able to compare it. with Tod's. The Agra which is the worst, and most carelessly written of all, is also from the same origin, with a great many extra blunders of its own. I do not know from what source the translations lately printed in the 'Indian Antiquary' are derived, but from the absence of proper arrangement and the scanty nature of many of the extracts, it is probable that the MS. was not a perfect one. As to the many imperfect scraps which may be found here and there in the libraries of native princes, they are so fragmentary and so interspersed with matter which Chand never wrote, and their language has often been so obviously modernized, that it will be wiser to disregard them altogether, classing them under the head of "pseudo-Chand fragments," and sticking to the few complete copies which are accessible. For working purposes, Dr. Hoernle and myself are taking Tod's as our basis, occasionally assisted by the Baidla and Agra. Caulfield's and the Bodieian being locked up in English libraries cannot be used.

Taking then the work as it stands, and not troubling ourselves in our present initiatory stage with either spelling or text, the following notes may be found useful to start with, though many of them may have to be modified as we learn more about our subject. For it must be steadily borne in mind that we are only at the beginning of the battle, and have no predecessors in the field, of whose labours we can avail ourselves. Everything hereinafter stated, is therefore tentative, and, pro hac vice only, dogmatizing would be premature. Moreover, Chand is the earliest poet in the language, and we can therefore illustrate him only by his successors; his relations to those who went before him are absolutely indeterminable for the present, and will probably long remain obscure.

The pronoun as the oldest and most characteristic part of the language may be taken first. The forms observable approach very closely to those in use in all the Hindi poets down to a late date, the pronoun being peculiarly tenacious of its ancient forms.

Both in the noun and pronoun, the synthetical process has been to a great extent rejected, while the analytical is as yet in an imperfect state of development. Thus, three states or forms of the singular, and three of the plural, may be detected in the pronoun: first, the direct or simple form, used for the nominative: second, the oblique, used for all cases, sometimes with the addition of post-positions as $\frac{1}{11}$, $\frac{$

The pronouns of the first, second, and third persons are exactly parallel, the first being modifications of a theme mo, the second of to, and the third of td (yd and vd).

It will perhaps be useful in a little known author like Chand to give rather copious illustrations of each form first, and then to tabulate the results at the end.

The commonest form for the nominative of the first person is री. This is derived from the Skr. चच्च by rejection of the च and resolution of the final m into its compound elements, as in नांच = पास (see my Comp. Gram., Vol. 1, p. 254). One example may suffice for this very frequent form.

ती हैं। एखां देह ॥

Then I quit the body (i. e., kill myself) I. 157. 2.*

Differing only by the omission of one of the top strokes and therefore to be regarded more as a variation in writing than as a separate form is $\overline{\bullet t}$, as

से से पन दनत के मात।

I am (constantly) hearing all that, O mother. I. 160. 4.

चें जानि ग्यान रच करीं तेरि ॥

I knowing science tell this to thee. III. 27. 50.

The form \$\vec{*}\$ often written \$\vec{*}\$ and so hardly to be distinguished from the post-position 'in,' occurs in a few passages, as

में चुन्या चादि दिन चंदि कीन तकि भान चान में तप जीन ॥

I heard the Shah had deprived (him) of eyes.

Abandoning food I practised austerities and penance. LXV. 110, 17-18 In these lines, and wherever else it occurs, में is used before the past tense of an active verb, showing that it was still regarded as an instrumental, as it is by origin from the instr. of Sanskr. मदा., Prak. मद and सर. Chand I believe wrote simply में, as in Marathi मो; the anunsisks is a modern

• The Roman numeral indicates the Book of Chand's poem, the first Arabic numeral, the canto or poem (Kavitt), the second the line. The numbering follows my list in J. A. S. B., Vol. xli, p. 204.

addition, so is the use of से as a nominative, and the modern fashion of saying से के is founded upon ignorance of the true nature of the word and contains the instrumental twice over.

For बारि, commonest of the oblique forms, innumerable examples may be found. Two may suffice, as the form is also in use in mediæval Hindi, down to the seventeenth century at least.

कडी मोडिन वर मेडि ॥ I, 192. 2.

The lord of Mohini (Durgâ) hath said to me.

नदी नेादि काम पिता राजधान ॥ LXIV, 360: 9.

There is no business for me in my father's palace.

(i. e., What have I to do with it?)

It is apparently Chand's idea of metre, for he has some ideas on the subject, that leads him to shorten this form constantly into सृष्टि, as:

नो मुद्धि ड्रंडा निगल्लिई. I, 170. 2.

If Dhundha shall swallow me.

तव स्त्रीय कष्ट द्रिङ तन ॥ तव स्त्रीय स्त्रमुख गात ॥

जब जिंग हैं। बाया नहीं ॥ तो पाइ न चेवात ॥ I. 276. 1-4.

Till then pain and poverty (were in my) body.

Till then my limbs were light; (i. e., mean, contemptible).

As long as I came not (to thee),

And worshipped at thy feet.

The final short i is sometimes omitted, as

मुख राज्यों इच मत ॥ I. 179. 2.

This opinion seems (right) to me.

Commoner than any except *mohi* is the form $\overline{\mathbf{n}}$, used for all cases, sometimes with, but oftener without, post-positions, as

किम ज्वार में। चोड् ॥ I. 188. 11.

How shall there be salvation for me.

जिष्डि चत्या वप मा तात गर । I. 49. 9.

He who killed the snake (on) my father's neck.

भइ. जाति वृषिधन मृपति ॥ } VI. 18. 1-2.

Bhat by caste, king of poets. Lord! my name (is) Chand.

बैसी कि सो कड़ डर पान्ड । 1. 160. 1.

Having thus said for me you find fear.

(i. a., You put fear into mind).

जो में। ची चाच व वदी # I. 157. 1.

If you do not speak the truth to me. .

Instances of the form was are also frequent.

Palkelahna i'utus Libraga

इक घरनी भुमा वित परवित ॥ І. 279. 1.

This land (was) my father's and my ancestors'.

का कि व वंसि उपचा || तूं मुक्त जंपिक सार्च || I. 147. 8, 4.

Who (am I), from what race sprung Tell thou to me, O mother.

Instances of सेरे are as follows:

सुरे कडूरे दाय न शावड ॥ I. 160. 2.

You have no pity on mc.

(Lit. Of me any pity not comes.)

सत भात मेरे पते॥

Seven brothers of mine are slain. V. 61. 3.

इच मेरी चरदािष ॥ (i. e. سشدها).

This is my petition. I. 228. 2.

For the nominative plural TH is universal;

इस तुम कवडं नहि विदय ॥

We (and) you had never strife, I. 210. 29.

चम तुम काम र्चि वेत चाज ॥

We and you (have) business (on) this field to-day. 1b. 31.

The oblique form is समि and the genitive समारी •रे •री.

षावदा सुना समारा वानीय॥

Alhá, hear my word. XXI. 145. 2.

The nom. is used when we must translate by a genitive or other oblique case, as in चस सरण दिवस, the day of the death of me. I. 210. 27. It is a nom. again in

करें कल दम मानी सम्बद्ध

Quoth Kanh, honorable (are) we all. VI. 82. 1.

The post-positions are affixed as in the modern language TH T, etc.

For the second person the singular nom. जू has been quoted above, as also the plural nom. तुस; the former has an emphatic form as in the hymn to Bhavani—

तुंची बच्च गेरावरी गेमतीयं॥ तुंची वर्वेदा कमना सरसतीयं॥

Thou art Gangâ Godâvari, Gomati,

Thou, Narbadâ, Jamuná, Saraswati. LXV. 16.

And so on through some forty lines. In the following, however, we have the oblique form: the only difference is the absence of the anunasika. The i is lengthened metri gratia;

चने कवा चन्ने॥ तुची नाम सुन्ने॥

Before all affairs. Thy name is affixed.

Hymn to Ganesha, I. 26. 26.

Sabai Kajja aggai tuhî nama laggai,

The regular form for the oblique is, as might be expected, নাৰি; বুড

Sambhû is pleased with thee (तृडे = तृड).

Shortened to तुन्हि, as in जदि न त्राप तुन्हि भया ॥ I. 60. 1.

If there were not a curse on thee.

Or to ता, as

द्धनिय बात ती तात ॥ I. 250. 1.

Hearing (this) word, thy father.

Parallel to the first person, occurs নুদ্ধ, স্বৰৰ ঘৰাত নুদ্ধ I Let me tell the tale to thee. LXV. 314.

There is also the Prakritic form तुष in तुष पुनर पान नधू अरनं॥ Thy sons and grandsons from the wombs of thy wives. I. 280. 3., and तुष भुज वस अचिरज कर।। Say that the strength of thy arm is wonderful. LXV. 325. 3:

The oblique form of the plural is तुमिंद, and of constant occurrence.

पुन एक जन्न तुमिरि॥

I ask one son of thee. I. 88. 3.

के सिर तुमांच समिपदी।

के सिर धरिष्ठी एव ॥

Either I will yield my head to thee,

Or I will put the umbrella over my head. I. 279. 3, 4.

(i. e., I will conquer thee, or die,)

The post-positions are used with तुम, as तुम कीं, तुम चैं।, etc.

For the third person we have a definite personal pronoun $\overline{\mathfrak{A}}$, as well as the two demonstratives $\overline{\mathfrak{A}}$ and $\overline{\mathfrak{A}}$ — this, that, with their respective formations.

दर 'this' is found repeatedly साहि दर बागस नुष्ये॥ To me this future appears clear. I. 28. 2.

The oblique form is यांचि, यांचि सन्पूरन की चिर काजं॥ To complete this (is) a work determined on. I. 87. 6.

I am disposed to see a shortened form in the line

इड य (या) चित मे। चित ॥

This was his thought and my thought. I. 251. 4.

Both the nom. plural of st and an emphatic singular of t are contrasted in the following:

वे बार्ड तरवारि ॥ इसे सुष पकरि स करें ॥

They ply their swords, He catching (them) in his mouth breaks (them). I. 254. 5, 6.

In order not to prolong this section too far, I will now merely give the

scheme of the pronouns as far as I have found them, or can construct them from analogy. The latter are in brackets.

1st Person.

2nd Person.

Sing. Nom. 4, 4

Oblique मेरि, मुक्ति, मेर, मुक्त, मुक्त Genitive सा, and मेरी •री •रे

Plur. Nom. TH

Oblique THE Genitive उसारी

3rd Person.

वं तंहि

तोषि, तुषि, तो, तुभा तुष, तो, तेरी •री •रे.

तुस occasionally in Gâthâ तुसं

. तुमिष

[तुन्हारा] तुन्हरे ०री

Sing. Nom. सा. he

Obl. तान्ति, ता Gen. सा की etc.

याचि, या याकी etc.

रूप this रूपे जह that जरे. वस वान्दि. वा वाकी etc.

ये रहे Pl. Nom. ਜੋ ਜੇਵ

Obl. तिनि, तिने, तिन इनि इन इन की Gen. तिम की

[जनि] जनः [जनकी]

नारि is shortened into तिरी, and thus corresponds with जिरि (pl. जिनि and किने) from जी.

The interrogative is की or की, oblique कि दि, pl. किन. Of other forms may be cited वितना and its series, also कैसी and its series shortened at times to विसे, जिसे etc. A curious double form occurs in the lines

जाके देख म चोई ॥ ताचि कैसें कें गचिये॥

He of whom there is no body,

Him in what way can one catch? I. 161. 8.

I suspect # here to be a relic of the verb kar, as in the same passage occurs the phrase

> किसं दिष्ट नस् भिद्र॥ ताचां केंसे करि सभी॥

Where the sight does not penetrate

There in what way can one see? ib. 4.

It would mean in full 'how having done? in what manner having acted.' The oblique form of the plural is used adverbially for 'how?,' and takes anuswara as in the first of the two last quoted instances. In the following it stands alone-

सारक दे बैसे जब कीना ॥ I. 154. 4.

How did Sárang De make war?

For fanal and its series we have also and the rest.

केते वर रिव राई ॥ भर कर बाजव अमे ॥ I. 162. 3-4.

How many men, and Rajarshis,

Have there been (and) gods and demons of you.

Chand's noun is rather a formless affair, as might have been expected, not only from the age in which he wrote, but from the style common to all those most obscure and difficult of writers, the Hindi poets. Like them, he loves to string together crude nouns, and leaves the reader to construct sentences out of them by mentally supplying the needful case-signs. This he does not merely in his rhapsodies where perhaps no very definite meaning is to be expected, but even in his narrative portions. Thus in the very first stanza

चिर चर जक्स जीव चन्दनसयं

(Literally) Firm. Going Living being. Life. Possessing qualities of sandal-wood.

All which may be put together into a sentence as the reader likes; or again—

कस बरनि बरनि सु कन्दः

Kali (yuga). Heroes. Heroes. Well. Strife.

नृपराज दुज गस विश

King. Brahmin. Neck. Bind.

Other instances afford a clue by some verbal form, or by the context; as

To all men anxiety arose. I. 149. 2.

for सब जननि की;

सेव बच्च इव खपावन ॥

By service much wealth is gained. I. 262. 8.

which may be rendered in Mod. Hindi thus सेव में बड़त हव का जवायन दोता है.

इरवार तास रुधि भरि वारि॥

The darbar became like a tank full of blood as water. V. 37. 1.

In full thus—द्वार तास जैसा हवा दविर से भरा हवा जैसा पानी से.
The case-signs, however, are fully and freely used when the metre allows.

The case-signs, however, are fully and freely used when the metre allows, and I shall now give instances of their use, exhibiting the more ancient as well as the transitional forms, and those which are identical in form with the modern post-position.

The objective case, including both dative and accusative, is indicated by the preposition, concerning whose origin I reserve my opinion for the present, *** Variant forms are ***, ***, *** from the last of which by dropping the anuswara comes the modern ***.

वर्षे द सेर्द तुम रक कुछ ॥

He seeks one of you. I. 88. 9.

* Provisionally, Trumpp's theory of the origin of this form from and resulting from the provision of the provision of the proving to elision of the provision of the provision of the provision of the from with the Dravidian ku (kku) must in any case be regarded as finally exploded and no longer tenable.

प्राप्त समे वर दुलन कर्ड ॥ वंटि चया कर दीन ॥

At morning time the hero to Brahmans

Dividing with his own hand gave (gifts) VII. 5. 3-4.

करि दंडीत स्वन कर्ज ॥

Having made obeisance to all. VI. 88. 2.

Another instance was quoted a while back under \$\overline{n}\$. The u is lengthened metri gratiff in

प्रिचीराज मादीन युद कहं। दम परिमाल वृक्षाद दन ॥

For the war with Prithiráj at Mahobá Parimál has summoned us, XXI. 84. 6.

The other forms are too common to need quotation.

Under the head of ablative, come several post-positions. सम is the older form from which come the forms सें, सें and से; thus—

करें दूत प्रशिराज सम ॥

Says the messenger to Prithiraj. XIII. 16. 1.

In Mod. Hindi, verbs of speaking take स; the original meaning of which is shown by its derivation from सम to be 'with,' though in modern times often used in the sense of 'from;' for which latter the proper word is तं or ते to be noticed presently. Instances of सं occur frequently, one has been given above, another one of सम is कार्त साम कांत, 'says the wife to her husband,' I. 7. 1., where सम precedes the noun; as it stands we should understand it to mean 'says the husband to the wife,' there is, however, no doubt from the context that it is Chand's wife who speaks to him, not he to her. The use of the particle before the noun, shews that it had not yet thoroughly sunk into a post-position, but is still used as a conjunction, as in Sanskrit.

परि with forms पर, पे, and पे is used as in ordinary old Hindi.

ते, mostly with abnormal anuswar ते, is I take it from ता, (just as चे from जा or चे) a regular ablative termination in Prakrit, from the Sanskrit adverbial ablative in तच, as यामतच्, from a village, though it has become severed from the noun and is treated as a post-position. Instances are

ता के कुछ तें उपनी ॥

From his race sprung. I. 164. 1.

तुम करें। करं जीव तें वध ॥

Say ye, (and) I make him destroyed from life. I. 178. 21. (i. e., If you give the order, I will kill him.)

For the locative, we find the many-formed post-position represented in modern times by \$\delta\$. In its earliest form it is \$\delta \delta \delta\$, then dropping the \$e\$, \$\delta \delta \delta\$.

चयत सु वत सथा विश्व।

Immortal dwelling among mortal. I. 8. 8.

इड ने छि नानी इस मध्य चाया ॥

Having spoken this speech, he came amongst the army. XXI. 10. 17.

Next comes the solution of the semivowel into its vowel, giving with,

चनार सुतीन परे घर मधि॥

Thousands three fell on earth, XXI, 7, 59.

Sometimes written भिंद, when a long syllable is required,

जागिनीय नई रागिनी मिस ॥

The witch went among the queens. I. 178. 9.

(रागिनी for राजी like चिमयान for चज्ञान and चाम्या for चाजा)

The natural transition from भ + य into भ (see my Comp. Grammar, p. 326.) gives the form सन्ति—

मुद्देव परिय मिश्र विस् वयाव॥

Fell headlong into the bottomless pit. I. 79. 10.

(मुद्देव a form of 3 sing. pret. for मृद्दी from माच and therefore meaning "was set free," in combination with परना = पडना 'to fall,' it means 'was set free falling,' i. e., 'fell unrestrainedly or headlong.')

Final short vowels are of very little account in Hindi, and are omitted or inserted at will. Thus forms wive and was, with inorganic anuswara, and in the former with lengthening of the vowel, occur.

उपवाग भांभा चिल गये चाप ॥

They themselves went into the garden. XXI. 5. 6.

(अपनान a curious combination of जप with ं , after the fashion of जपनन).

को राजन कवन घर सभाभां॥

What king, in what land? XXVI. 18. 4.

The metre is Gatha which accounts for the Sanskritisms. Chand always puts an anuswara to the last syllable of his words when writing Gatha, he seems to be under the impression that by so doing, he is making them into Sanskrit! In the next line we get

परचर उजेन मभां॥

In wealthy Ujjain.

(परचर = प्रचुर abounding in wealth). I have seen also frequently सभा and संभा, but have lost the references to them in my notes. A lengthened or secondary form सभार is also in use with the more definite meaning of "in the midst of."

नर नारी खचा नई॥

फानुन साथ संबार ॥

Men and women cast aside shame

In the midst of the month of Phagun. XXIII. 1. 4.

Alluding to the Holi festival.

के ववरि सकर पक्कची सभार ॥ (सबर - شهر, and ववरि خبر).

Having received the news she arrived in the midst of the city. I. 178. 4.

चरि भनि गये जिर वन सभार

The enemy fled into the hills and forests. I. 206. 38.

A step further brings to the rejection of the organic portion of the aspirated letter, leaving only , we thus account for the form wit, which is extremely common.

कळाल मचि कलूरी॥

रानी रेचंत नयन प्रकारं॥

Putting musk into lamp black

The queen streaks her eyes for ornament. (Gâtha) I. 20. 1. (Tra from Ta, line).

दिन सत च्वधि चंतर बक्रत ॥

हरि स जबरे दिनक महि॥

A period of seven days is ample time,

Hari can save in a single instant. I. 60. 12.

The post-position is here affixed to the genitive as indicated by a, see further on under that case.

कारवंड सचि चरत ॥

Grazing in Jharkhand. I. 61. 3.

It is lengthened to मादी-

देखित खपति विश नींदा माडी ॥

Seeing the king sitting in sleep. I. 191. 4.

स्रायी भीर जन्दन पर्या घर मांची ॥

The hero Jalhan was smitten and fell on the ground. XXI. 264, 20.

And if I am right in my translation, still further to #it-

पिय रन मांचें मरे॥

नारी सती न दोय॥

(If her) husband die in battle,

The wife does not become a Sati. XXI. 175. 1.

Lastly, we have the ordinary modern form \$\forall\$, the anuswara of which is, as so often the case in Hindi, a mere inorganic accretion.

विव कि सरत निया रके। करें पुत्र को आस ॥ बक्र जारी निक्कें करें। वडे जरक में वास ॥

The wife who survives when her husband dies, and hopes for progeny,

That woman certainly makes her abode in the great hell. XXI. 174.

I suspect the whole of this verse to be a modern interpolation. The style and versification are too regular for Chand, and the sentiment is

repeated from the preceding lines which are more rugged and Chandesque

निष्ये वेद नरक ताषि भाषे॥ पिय कीं सरत विया तन राषे॥

¥ is, however, found in many passages where there is no reason for suspicion.

रक मास में नगर वसाया ॥

In one month he established a city. I. 218. 3.

बही कन्द्र के कंध में पमा नाया।

He brought down his sword on the shoulder of strong Kanh. XXI. 264. 24.

Of the instrumental case indicated by \hat{r} as we have it in modern times, I cannot point to any clear instance. When we come to treat of the verb, the construction involving this case will be illustrated.

There remains only the genitive, and this is indicated by the particles \overline{a} , \overline{a} or \overline{a} , and \overline{a} , as in ordinary Hindi. Sometimes shortened to \overline{a} as in one instance quoted above. Two passages may be noted in which the older form \overline{a} , \overline{a} , which has been recently brought to light by Dr. Hoernle, seems to be found. The first is that in the nineteenth (now 20th) book, in which I formerly saw a pret. of a verb \overline{a} , This view must now be given up, and the passage translated differently; it is a very obscure passage, however, and I now only give a tentative rendering. It is the rout of Shihábuddín's army by Prithiráj.

हारे गण चंधं चाक्रवान करे। ॥ करीयं गिरटंन चिट्ठीं चन्न फरी॥

Blind (from flowing of blood) ran the elephant of the Chauhan, Making a circle he surrounded on all four sides. XX. 141. 7-8. The other passage is at the meeting of the armies before Mahoba.

किया नद नीक्षान पाजें सुपेरी ॥ भिदो दिखि सें दिखि चाजवान केरी ॥XXI. 29. 9-10.

पांचे in Chand and in other bards, though plural in form, is always treated as a feminine singular.

The kettle drum made a noise, the army turned, The sight of the Chauhan was separated from view.

That is, the two armies lost sight of each other, probably from the dust they raised. It will be observed that it in the first quotation agrees with the masc. They, and it in the second with the fem. They, so that we have so far confirmation of Dr. Hoernle's theory. I have traced forms it and it, as well as it, in the cognate languages. From the vast ocean of Chand fresh examples will probably be fished up, as we get to know more about it; at present I have only these two instances in my note book.

With regard to the modification of the base in nouns nothing noticeable is to be found, except that Chand occasionally uses the nom. or direct form of bases in 4 before the post-position, as

राज चार हेरा मधि॥

The king came into his tent. I. 193. 2.

Where we should expect *; and again

ति हि वेरां खाया कहै। देरा माहि पनमा

At that time came somehow into the tent a snake. I. 243 4.

Instances of this practice may be found in Tulsi Das and later poets, and in the tika to the Bhaktamala, and it is universal in Bengali.

There is a curious word in two or three forms, as usual with Chand's words, about which there is some obscurity. It is sint or sin and must, it appears to me, be translated "from;" though it looks at times like an imperfect of the verb in which case I take it to be one step in the process by which we get to ut, which will be noticed under the verb. I give the examples I have noted. In the first, Bisal De is asking his minister about the shrine of Gokaran which he wishes to visit.

केतीक दूर चजमेर हात॥ दिन दोय मंभा नीके पहांत॥

How far (is it) from Ajmer?

In two days easily one arrives. I. 178, 47.

Here, by the bye, is win which I wanted a while ago. When Bisal gets to Gokaran he meets a Siddha who asks him where he comes from.

करत सिथ किरि पुर इंतो॥ कोन मेत किरि नाम॥ इरि तोरथ याथे इते॥ कै याने कोई कास. I. 184.

Saith the Sidha from what city,
What family, what name?
Had you come here on pilgrimage,
Or (have you) further on any business?

In the first line sair must be "from," but in the third line sai is pl. of sair, = s. In the next passage the doubt is still greater, and the whole passage is a peculiarly crabbed one.

इति चनुषास्य संद ॥
कस्त नरनि चरनि सु बंद ॥
निक्ष नास्त पितस् सोर ॥
दुस स्रोते दुसनिय मेर ॥ I. 48. 1-4.

Here begins the Hanuphal metre. In the Kali (Yug) heroes (had with) heroes strife, Not together harmony or union, Brahmin was to Brahmins cruel.

नास is still used in Panjabi for "with," भार is still Marwari भूरा 'wick-ed, cruel," mod. Hindi नुरा. Now in this passage डांग may either be "was," or we may render it "from," as "Brahmin from Brahmins (was) averse, or cruel." The meaning would more strictly be 'towards,' but in the mod. language से would be quite admissible. On the whole, though, I am in favour of regarding it as a verb in this passage.

In those places where it is clearly a postposition, it may still be derived from the root $\widehat{\P}$, and be analogous to the Bengali \widehat{C} , 'from,' Marathi \widehat{R} , and comes from the Prakrit ablative plural \widehat{R} .

The plural is formed by **T**, the final **T** of which is frequently omitted, and the plural itself is often represented by the singular form. The practice of confounding the two numbers is as old as Chand, and probably, for all we know, older. Plural verbs are used with singular nouns, and feminine verbs with masculine nouns and vice verså, as in the line

तब सकल भर्य एक नारि ॥

Then all the women were assembled together. I. 178. 1.

Where बारि is plural in sense, though singular in form, while the verb is singular.

सब माति कच्छी॥

All the wives said. ib.

Here again चाति is fem. pl. and the verb masc. sing., which arises from the instrumental construction.

क्या किया चंदाच ॥

The bride made lamentation. I. 171. 2.

TIT.

The verb is modern in form, exhibiting the birth of the analytical system, as yet weak and uncertain, but already indicating the direction of its future development.

The number of forms in use is few, and Chand seems to regard verba as a superfluity in many instances, omitting them at will, and often substituting for all forms of the verb what I may call the verbal crude form, produced by adding a short i to the root. Though this form is strictly speaking that of the conjunctive participle "having done," and the like, yet there are countless passages in Chand where it will not bear this meaning, but a present, past, or future, as the context may require. For instance in

चनस चानि सामच किसी ॥ किष घर वात सुनार ॥ । राजन वंत्र से ॥ भूमि क्यारे जार ॥ I. 309. Anal having come met (his) mother, having told and recited the whole affair,

People and merchants having taken with (him), having gone colonized the land.

All the forms in i as wife, we set, we get and even that is a participles, and the only finite verb in sense is well, and even that is a participle in form agreeing with the fem. noun wife and postulating the instrumental form of the agent. In modern Hindi we should have were in the fellowing:

सिर संडि चनर वीमल नरिंद्॥

Bisal the king arrays the umbrella over his head. I. 166. 1.

If we translate wife "having arrayed," the sentence will be incomplete as there is no finite verb following. The explanation of this use of the grown is probably that it is a shortening of the grown of the 3 pers., and in this place it would stand for wife. The simple indef. present is the same in all the modern Aryan languages, and in Chand presents no peculiarities.

	Singular.		Plural.
1.	करों, कद	•	करें
2.	करें		करी
3.	करे		करें

It is unnecessary to quote examples for the regular verb; the irregular verbs (to use a rather unscientific term) will be noticed presently.

For the simple past the forms are participial and the same for all three persons on account of the implied or expressed instrumental construction.

	Singular.	Plural
100	(masc. चन्द्री	परी
1. 2. 3.	fem. चनी	ৰ ণ্ডী

In the masc. sing. the final $\frac{1}{2}$ is sometimes separated by a short a from the root, according to no rule apparently; for in I. 170. 12 we find $\frac{1}{2}$ at a few in there a lion destroyed the bridegroom, while in the very next line it is written the few in a variants of the form in $\frac{1}{2}$ constantly occur those in $\frac{1}{2}$ and $\frac{1}{2}$ where the $\frac{1}{2}$ has been softened to the palatal vowel and the vowel 1 hardened to its semivowel. Thus

चन द्वि द्वि अभेव जाव ॥

Looking looking down wandered the cow. I. 79. 9.

In the same passage occur सुदेष, quoted above, and सर्वेष 'she heard' (foot करे). Instances of the shorter form are

िषार पाष्य पृक्षिण नांस ॥ Again Alhá spoke in wrath. XXI. 109, 47.

Also wiles, with and many others. The form in we is common in Tulsi Das.

For the future where no very strong idea of futurity is implied, the indefinite present is used, as in ती दो दंद, 'then I will quit the body.' But the ordinary form of the future is derivable directly from the second or periphrastic future of Sanskrit, as in स्तितासि, भवितासि, and in the third person postulates a non-classical form भवितासि, for which in Sanskrit we have only भविता without the substantive verb. The forms are—

• •		
	Singular.	Plural
1.	चिंहीं	चिक्त हैं
2.	चिमिष्	चिन्दी
3.	चलिय	चिलिके

To be referred back to a Sanskrit series, Singular অভিনামি, অভিনামি [বভিনামি]; Plural বভিনামা বভিনাম, [বভিনামিন], but in all cases with clision of the syllable না, so that we should imagine a form বভি-মুখ্মি বজামি. The terminations rest on the excessive corruption of the feeble verb বুল; so that অমি becomes অমি and then, by rejection of মৃ মি. The resolution of ম into its component parts, the labial and nasal, so frequently noticed in other instances, gives হাঁ, whence হাঁ, so that we have three words হাঁ, one from মুবামি, a second from অমি, and a third from মুবামি, as a good instance of this verb in a transitional state the Marathi forms may be adduced.

Singular.	Plural.
1. খাই (খঝি)	षाचें (षकः)
2. चार्चेस (चिस्ता)*	षाचां (षस्र)
3. স্থান্ট (স্থান্ধি)	चाचेत (चरंति)

In old Hindi also, as for instance in Kabir's Ramaini, occur the forms wife 'is' and wife 'are,' from which we get and in mod. Hindi.

It would lead me too far away from my present object, which is merely to illustrate Chand's forms, were I to work out all these processes here. I content myself therefore with merely noticing them, and pass on to give examples. Of the first person we have already had the instances समापना 'I will yield,' as it were, from (समापितासि fut. of the causal of with सम) and मिरी, 'I will place.' The third person, with which the second is identical in form, was shown in जिन्नासि 'he shall swallow;' for the first plural

इस सांवंत सर जुलियें।। राज चंद्रेस न आय।

We nobles all will fight,

That the kingdom of the Chandel may not perish. XXI, 94, 8-4.

 We must take the full ancient forms assi, asmah, astha, and asanti, instead of the more modern classical Sanskrit forms, as the letters which have been dropped in the latter are phonetically necessary to produce the Marathi, Hindi, and other words: The infinitive or verbal noun has two forms, the abstract in ana, and the functional in iba. Of the former one instance out of many is

पुरवातन तिन वंधन विचारि॥

Having plotted to stop (or the stopping of) his virility I. 178. 1.

[पुरवातन = पुरवाता], and with nominal inflexion,

किया चलन की साज ॥

He made preparation for going. XX. 28. 4.

वंग जुरन वासिम जुभार ॥ (जंग = طالم जासिम = طالم)

In joining battle a terrible warrior. XX. 31. 5.

The functional form is of very common use, just as it is still in Gânwâri Hindi, ia Bengali, Oriya, and Gujrati.

को विसंव करि रहै॥

ता ताडि डिनने की बानै ॥

If any one made delay, Then he came to strike him. I. 198. 7.

खि सरिवे की घाया।

Rising up, ran to fight. I. 254. 7.

The construction is strange, but not unknown to modern colloquial Hindi in

गारि मात सिष्यते॥ पुत्र चानल इष सिष्यिय॥

Through learning (it) from his mother Gauri Her son Anal learnt this. I. 258, 1-2.

In modern Hindi, नारी मा क सीवने से यह सीवा चानस क.

The imperative exhibits the ordinary forms acs sing. and and plural, as

वामनक भट चने घर जाउ ॥

Bard Jagnak, now go thou home. XX. 77. 1.

Owing to the careless way in which i and u are mixed up, we have a form in te-

तिन सु गवर चन्दी करवि॥

Say a good word about them. I. 9. 12.

In two quotations above we have seen conversely पावड and wides used as present indicatives, for पावडि and wides.

The present participle ends in at, as दुनत, देपत, and in Gatha, as well as occasionally in other metres where a long syllable is wanted, in ant, as in देपत, कर्नत. The feminine is in short i, as द्यति, also of course i, as द्यति, करती, etc.

The conjunctive participle in *i* has already been mentioned, its original full form is in *iyai*, from the locative of the part. pret. of Skr. Thus from That we get That. (See Trumpp, on Adi Granth., J. R. A. S., Vol. V, p.

207. I see nothing in the extracts given by Trumpp in that article to justify his assertion that the language of the Granth is not Hindi, but old Gurmukhi. It is a mistake, though common among Sikhs themselves, to apply the term Gurmukhi to the dialect of the Panjáb, instead of the variety of Devanagari in which it is written, sed have obiter.)

विश्व किये भूमियां भूमि प्रमा॥

Having subdued the rulers of the land with fire and sword.

I. 206, 26.

This is of course often also written with e, as মুনিই, whence we get another of Chand's confusions, as this form is also used for the respectful imperative, as in

रू नष्ट ग्यान सुनिये न कान ॥

This destroyed science do not listen to. I. 173. 9.

One of the principal difficulties in Chand lies in his construction; an abrupt and elliptical style is imposed on him by his rules, and he makes it worse by trying to say too much at once. So that we have often to expand four of his words into twelve English, and his transitions are so rapid from one fact to another, that we are often landed quite in the middle of a fresh set of events before we are well quit of the old ones.

The custom of constructing the past tense of transitive verbs with the instrumental of the agent with the post-position ने, though identical in character with the Sanskrit construction, as in तेन जाई विद्योध, is yet apparently insits present shape at least of modern origin. It is an obscure question what this ने really is. That it is not derived from the एन of the Sanskr. is pretty clear. ने the older form, sometimes written नाई, is a dative, and is, I believe, connected with the same root as the Marathi सानी, Naipali and old Bengali सानि, whence also Marathi सा, the ordinary sign of the dative. It is difficult to decide exactly what Chand's usage is in this respect. While in some cases the agent is in an oblique form, in others it is in the direct or nominative.

The modern Aryan languages know of three constructions or prayogas.

1. The Karta, or subjective, in which the verb agrees with its subject.

2. The Karma, or objective, in which it agrees with its object.

3. The Bhava, impersonal, in which it agrees with neither. They may be thus illustrated in Latin.

Karta—ille urbem condidit. Karma—ab illo urbs condita. Bhâva—ab illo urbi conditum.

These three constructions are seen in their full force in that most complicated of all the languages, Marathi, with its irritating three genders and old-world rubbish of that sort. Hindi is more enlightened and simpler.

It has the subjective construction for all tenses of the intransitive verb, and for all tenses of the transitive also, except the preterite in which it admits the objective construction, as राजा ने बात सूनी, also the impersonal as राजा ने बात सूनी, also the impersonal as राजा ने बात सूनी का देखा. In the former the verb agrees with the object, and in the latter is neuter and impersonal, Hindi having amalgamated the neuter with the masc., the verb has attained to the masc. form, though really neuter.

Applying the above principles to Chand, we are struck in the first instance by the absence of \Re with the instrumental sense. For instance—

प्रविराज सनि जंबर नें॥ चाप नुवार दित ॥

Hearing it, the prince Prithiráj

. Himself invited them kindly. V. 13. 3.

Here if we are to see in this our modern friend, the object not being noted, but being understood as living beings, we should according to rule expect उचारा, and the sentence would run in ordinary Hindi कार ने उन्हों का उचारा, in other words, the construction would be the impersonal one, the verb would be singular (masc.), unless it be that the verb is here put in the plural out of respect. This instance, however, seems at present quite exceptional, more usually the agent is in the oblique crude form, and both the objective and impersonal constructions are used; a good example of the former is

तिन रचा कीनी सुदुज॥

He protected the Brahmans. I. 136. 1.

Where the verb agrees with the object rakshā, and the agent is in the crude oblique which may be any case we like to call it; again

जिदि रचे सुरम भू सत्त पाताल ॥

Who arranged heaven, earth, the seven hells. I. 11. 11.

The various nouns agree with the verb in the neuter pl. and the agent is again singular oblique. On the other hand, we have the direct or subjective construction in

द्य बार बुआ्यी राज ॥ दुज न दिया उत्तर काज॥

Ten times the king asked

The Brahman gave no answer (in the) matter. I. 48. 23-24.

And as a remarkable instance of Chand's indifference to the subject we have in one line (I. 49. 9.) कि दि परो अप 'he who killed the snake,' and the next line की परो अप, with the direct construction. It is perhaps too early to lay down rules for Chand yet, but it may be hinted that in common with many of his successors in Indian poetry, he generally uses the subjective construction when the agent is a noun, and occasionally the objective or impersonal when the agent is a pronoun, and even in that case he is careless

and quite as likely to use one as the other. As far as I have gone, I have met very few instances of the use of the post-position , and several of those seem doubtful.

One example is

वाख्यम प्रथिराज में ॥ निषि सुपनंतर चिक्र ॥ से क्यानिपुरस् ॥ तिस्क मध्य करि दिग्स॥

In his youth to Prithiraj

In a dream at night (came) a sign:

Having taken Juginipur (Delhi)

He put the tilak (of sovereignty) on his brow. III. 3. 1-4.

Here it is clearly a dative.

With regard to the irregular verbs, or to speak more correctly, those which still retain traces of the older synthetical organization, the array of forms is rather varied. Some few well-worked verbs differ from their fellows in this respect that, whereas the latter have taken from the Sanskr. or Prakr. only the root, or some one form on which they have built up their modern verb with all its varied tenses, these verbs of the older creation adhere more closely to the Prakrit and take their preterite from its preterite and some of their other forms from those of the corresponding tense in Prakrit. Thus देना makes its past tense दिया, from दिता, for दत्त ; also दीना from दिया, and होंचे। from दिन्ना, all three Prakr. forms. Of the three the commonest perhaps is दीना; to which rhyme कीना from करना, and जीना from जेना. In one or two passages occurs a form भीना, which I have rendered "filled," supposing it to be from भरना on the analogy of करना. In the cases of करना and खेना, Chand has also the preterites कीया and किया, जीया, but not जिया, the cause of which will be explained below. The three words दीना, कीना, and जीना are often shorn of their last syllable especially at the end of a line, as

वनक तुसा तदां कीन॥

He performed there the ceremony of *kanaktuld*. VIII. 5. 2. To which rhymes

वंडि चय कर दीन॥

Dividing, with his own hand gave. ib. 4.

परिमास ज्य पर अकुम दोन॥

Parinal gave the order for war. XXI. 5. 32.

द्व कीच जाय सुकाम कीन ॥ विश्व जान जनर पुर जूट कीन ॥

Having gone ten kos he made a halt,

The villages, towns and cities between he plundered. 208. 9-10.

It is one of Chand's favourite rhymes, and in all these cases the subject of verbs is a nom. masc. sing. Of the full forms, the following are examples:

चनंत्रपास पुनी सुरंग ॥ पुन रच्हा पास दिश्ला॥ नास्त्रिकेर फल सुफल ॥ संत चारंभन किश्ला॥

Concerning the translation of this passage there may be some doubt; literally it is easy enough, as the meaning of each individual word is well known, but how to put them together so as to make consecutive sentences is a difficulty; "Anangpal—daughter—beautiful (or, taking su as an expletive, 'delight')

Son—wish—fruit—gave. Cocoanut—fruit—good fruit. Spell (mantra)—beginning—made.

It probably means that Anangpál had a daughter whose desire for a son bore fruit (to wit by the birth of Prithiráj), the fruit of the cocoanut is the emblem of marriage, and he or she, commenced some spells, why or wherefore non liquet. It is a fair specimen of Chand's enigmatical style.

सुद चाव चंदेल सु कीनी॥ यस परिमाल लिखी करि दोनी॥

Good speed the Chandel made,

(Saying) "Parimal hath written this" gave it into his hand-XXI. 124. 4.

Of the forms (and) and the following instances have been noted:

बर दीधी बुंढा नरिंद् ॥

Phundhá the king gave a blessing. I. 305. 1.

प्राचराज ताचि दो देस दिख ॥

Prithiraj gave him two provinces. I. 307. 61.

Here the final syllable is cut off to rhyme with sites in the next line.

पुनी पुन उकार ॥ दान मान वन दिखिय ॥ भाम भाम गावत भमार ॥ मनऊ चरि वन मनि खबिय ॥

(For) joy (of his) daughter's (having a) son, gifts and honours many he gave,

House to house singing songs of joy, like a serpent finding a jewel in the forest (?).

The past tense wife a arises from the fact that the yerb lend in Hindi is derived from the Skr. was, through forms was and wife, and the pp. in Skr. is was, whence H. wiez. Although in Hindi the number of verbs of this class, those namely which form their present from one part of a Sanskr. verb, and their preterite from another, is so small that they have been classed as irregular, yet in the other cognate languages, notably in Sindhi and Gujarati, the number is very large; for instance Sindhi was to take (H.

चेना) makes its pp. चर्चा, i. e. चन्न. (See Trumpp's Sindhi Gr. p. 272, and my Comp. Gram. p. 138.)

I have also noted an instance in which the w under the influence of the adjacent palatal vowel changes into w (w)—

सगरी नाव जाय वंध किञ्चय ॥ बाला उदिल उतरन न दिव्यय ॥

Carts and boats he went and stopped.

Alá and Udil he allowed not to alight. XXI. 86. 1-2.

In Modern Hindi, वध किया and जनमें निंह दिया.

Leaving for the present the further discussion of these verbs whose real nature seems not to have hitherto been clearly understood, I now proceed to draw out the manifold variations of the verb 'to be,' whether derived from the root we or from we or (if it be so at all, which I much doubt in Hindi) from we.

Illustrations from Chand serve not only for his works, but in many cases also for old Hindi literature in general. Tulsi Das, Sur Das, Kesab Das, Kabir, and others are all writers in virtually the same idiom, though Chand is older and more obscure than most of them, and has occasionally forms which have dropped out of use since his time. It will strike the reader, however, that Chand uses the same word in different stages of development according as it suits his purpose. In the case for instance of we have every stage from the pure Sanskrit down to the modern vernacular. In such cases it is generally the modern and later forms which agree with those in use in the general run of Hindi poets. Tulsi Das. though, from his extensive popularity, he is usually taken as the typical poet of mediaval Hindi, is not so really from a linguistic point of view. His language is very rustic, and seems, as Dr. Hoernle has remarked, to contain words and forms taken from all the provinces of Hindustan. Sur Das is much purer and more typical. The forms given below are not then all peculiar to Chand, but many of them he shares with his successors.

The preterite, which for convenience sake I take first, as in a narrative poem like this, it naturally occurs oftener than the other tenses, has three forms.

1st form Sing. m. भया, Pl. M. सर f. भर्दे [भर्दे] भया is very common, as in भया ताम तामस राज ॥ Wroth was then the king. I. 48. 26.

Wroth was then the king, I. 48. 2 यो भरी दिवि चवभूत॥

Thus was the wonderful Rishi. ib.

Anangpal became king. III. 17. 4.

It is contracted to भी, in दानि भवन राज सन से। जहेन #

Hearing the news the king was perturbed in spirit. I. 172. 4.

सन भी चाछ बदन पुनि चाइच॥

Laughter was in her mind, then pity came. III. 10. 4.

Feminine W, as in ordinary mediæval Hindi, as

पुन्न कथा न्यीं अर्द ॥

How the former story was. III. 15. 2.

Plural mase. अर, as भर विकल खान चारक जनाय !

The folk were harassed, wounded, and distressed. XXI. 5. 5.

Of अर्', the fem. pl., I have no examples. In तव सकस भर्य रक्ष वारि। quoted above, it may perhaps be that a fem. pl. is meant and the anuswara has been omitted by the copyist.

The second form is sai and sai, plural sai, of which I have already given instances. It is from this form (Skr. wa) that I derive w, and not from war. The u of sai goes out in Gujarati wai, etc., in which language the form wai, the legitimate descendant of war stands in its proper place as the preterite of a verb wy from wi, parallel to which is Oriya wai, preterite of wai, side by side with wai from wai (w). From the form wai, by elision of a and coalition of the vowels (perhaps through a transitional form wai), comes the ordinary Brijbhasha form wi, wi, etc., and by another process the form wai became wi, i. e. tho, for h'to. The Hindi appears not to have retained any relics of the verb wi, as a verb, though it has numerous nominal derivatives of it.

Chand has yet another form of the preterite sew with short final a, not very uncommon in occurrence, as

सति बरक से व सम संव मानि ॥

उप राज काज वर चाइवान ॥

Grieve not, but heed my spell

Ruling has (ever) been the business of the doughty Chauhan. III. 27. 26.

Connected with which is the conjunctive participle sa, in

बीबाद अबी वर वन जवा।

The marriage having taken place, the bridegroom went to the forest. I. 170. 11.

The present tense contains no peculiarities. It is am' has been quoted, but I may mention that I have not yet come across the modern I is. It seems to come from II, which is first split up into III, then the Wis dropped leaving III from which by change of I into I and interpolating a second I, we get Tulsi Das and Kabir's form III, whence the transition is easy to II, i. s., I does not appear quite certain that all this process had been as yet gone through in Chand's time, the cases where I occurs are

all explainable as futures like चरिने, जुन्तिचे "he will do," "he will fight," and the like. Thus is formed the future चारचे, contracted into केने, just as in the imperative चार 'let there be' becomes के.

प्रके चोर्चे तिन वंस्ट ॥

Destruction shall be on their race. III. 29. 6.

सब बेंकि कहीं से सिदि सिदि॥

All speaking said, 'May there be success, success.' I. 178. 12. Another form is राष्ट्र.

होडि जहवनि सपत्र ॥

The Jadavani shall be with child. 1. 249. 6.

and the simpler form of the imperative is st

जिन सुनत सुध भव हो तहनि ॥ (तहनि = तन्तिनी)

Which bearing be thy nature purified, O lady. I. 14. 4.

In the substantive verb the vague crude form in short i occurs constantly, as a present and as future as well as in its more correct sense of a conjunctive participle. It is one of the commonest words and forms in Chand and more than one illustration must therefore be given.

There can be little doubt as to its future sense in the following ;-

दिवस पंच के चंतरे । दोइ स दिली पति ॥

In five days' time he shall be lord of Delhi. III. 11. 4.

Again a few lines later on

जीवनयर जीतिन करें। प्रभु स सेह प्रमु राव ॥

Of Jognagar (Delhi), saith the astrologer, Shall be lord indeed Prithi Rao (Prithiráj). ib. 13. 8-4.

And again-दंबर ते चाक्रवान ॥ चंन चार तरकानी ।

After the Tuar the Chahuvan, lastly shall be the Turk. ib. 26. 8.

All these three are prophecies, and there can be no doubt about the future sense, in which case we may regard this form as shortened from the fuller that. Less distinct, and hovering round to a potential present are—

कीं उधार चार वाप वर ॥

How may there be release from the curse for the hero. I. 58. 8.

करि सकों प्रव्य तो होई हास ॥

If I were to boast, then there might be laughter. I. 11. ult.

In the next quotation it must, I think, be regarded as distinct historical present—

वर्ष पर नृत पर पति ॥ ब्रोप प रंज्य पेट ॥ पाड्यान परेख इस ॥ बंदस प्रकार पेट ॥ XXI. 1. 1-4.

Telleth Chand reciting a virtuous strophe,

That wrath and discord,

(When twixt) Chahuván and Chandel tribes Strife is engendered.

burne se engendered.

So also in अवन द्वनत चीद् भंग ॥

The ear hearing it is broken. I. 159. 2.

चेद चेनचार चीता चरन ॥

The rape of Sitá, (which was) predestined, takes place. III. 27.84.

In this latter case it may also be a preterite. Finally, as instances of its use in its more legitimate sense of a conjunctive participle,

चोद् प्रसन्न सुकदेव कवि ॥

Being pleased saith Sukdev. I. 60. 10.

वैद्याक जीति जिन जार कीन ॥

तेच बये चंत चार चाच चीन ॥

They who swayed having conquered the three worlds,
They too have gone at last, being without profit. III. 27.
53, 54.

(ৰাত = ৰাষ)

Of the present participle there are two forms san and Tra.

तुस बाबो बाबी प्रसन्न

श्सन कवंत निवारि॥

Thy voice is a pleasing voice, laughing being prevented. I. 12.4. (i. e., no one can laugh at you.)

पुत्र दोत भई सत्य ॥

The son being born she died. I. 170. 3.

(i. e., she died in giving birth to the son.)

तें बब् चेनचार पच्चानिय॥

Thou knowing somewhat of that which is to be. XXI. 92. 2. And a few lines further on in a slightly different shape —

क्रमचार रेवी खपी ॥ क्वी जुन्माक्य खपाय ॥

Thus is written (as) about to be

The plan which Alha has said. XXI. 94. 1, 2.

Want of leisure prevents me at present from continuing these studies. I hope at a future time to supplement these remarks on the leading features of Chand's style, by some further suggestions as to some of his more exceptional and unusual forms—many of which are puzzles of the most startling description. Perhaps the notes here given may be of use so far

as they go, and the copious quotations will illustrate many more points than those which they are specially intended for. To those who approach Chand fortified by previous reading of the mediæval Hindi poets, the majority of the forms given above will be already to a great extent familiar, but to those who approach him from the direction of Sanskrit and Prakrit studies, his style will be absolutely unintelligible without some such clue as that, the outlines of which I have sketched in these notes.

Further note on coins from Kausambhi.—By The Honorable E. C. Bayley, C. S. I., C. S.

Since writing on the two coins sent by Bábu Sivaprasád from Kausambhi,* I have had the advantage of showing the coins themselves to General Cunningham. He at once expressed his preference for reading the third letter of No. 2, as $\forall sa$, instead of $\exists ja$. He said that he thought he had coins in his cabinet which would throw light on the matter.

He has since found two of which he kindly allows me to make use. One of these is the exact duplicate of coin No. 2, but has only the latter half of the inscription perfect. The other coin is in better preservation; its material is brass, and while it differs slightly in type, has the same legend as No. 2, but the third letter is unmistakably Ψ . The whole of the letters on this coin are of a squarer type than those of my coin, so much so that the first letter might almost be read as Ψ , "ba," if it were not for the clear shape of the letter on my coin.

The total legend must, however, now be read as— उद सत सित, " thaha sata mita"

"The friend of the virtuous iconoclast"-

A reading which is a clear improvement on those previously suggested. Both of General Cunningham's coins have the same reverse, a bull with the svastika over its hindquarters and standing in front of a Buddhist chaitya with Buddhist railing very clear, so that now there can hardly be any doubt of the Buddhist character of the legend. General Cunningham's best coin has the symbol on the left of the obverse somewhat different from my coin, but it is not quite distinct enough for satisfactory recognition. General Cunningham says that one of the coins at least was procured at Batesar, which is on the Jamuná, though at some distance above Kausambhi, from which place it may have possibly come.

* Vide above, page 109.

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Authorities for the History of the Portuguese in India.—By
T. W. H. TOLBORT, B. C. S.

The History of the Portuguese in India is a subject of considerable interest, though the attention given to it, of late years, by English orientalists is scant. As a contribution to the subject I submit a list of the authors whose works are most valuable. The list does not profess to be exhaustive, but it will be found to embrace the most important sources of information.

I limit the range of these authorities to the period between 1498, when Vasco da Gama discovered India, and 1663, when the capture of Cochin by the Dutch finally broke the power of the Portuguese, and established the supremacy of others in the East. During that period, the adventures of the Portuguese form a chapter of Universal History. In years subsequent to 1663, the subject, though not devoid of incidents of gallantry and romance, dwindles to one of national rather than universal interest.

As an introduction to the subject must be read Mr. Major's interesting Life of Prince Henry the Navigator. This is founded chiefly on old Portuguese authorities, an account of whom is given in the preface; but Mr. Major's narrative is, to all appearance, so complete and accurate, that we may accept it, coupled with the well written summary by Barros, without consulting other authors.

For our present purpose, research must begin where the main thread of Mr. Major's work ends. Starting then from 1497, we have first—

Gaspar Correa. Lendas da India, 4 Vols., 4to. Correa is the oldest historian, and is by many considered the most reliable; but, strange to say, his

25

history, though written in or about 1561, lay in manuscript till a few years ago, when it was printed by the Lisbon Academy. The publication was commenced in 1858 and concluded in 1864. Correa came to India in or about 1512, and served as Albuquerque's amanuensis. His stay in India was not continuous, but it was at Goa that he ended his days.

His history comprises the period from Vasco da Gama's voyage in 1497 to the Government of Jorge Cabral in 1550. The earlier portion is partly founded on the manuscript (now lost) of Joao Figueira, a priest who accompanied Vasco da Gama. The bulk of the work from 1512 to 1550 has all the advantages of contemporary history by the pen of a truthful and intelligent writer. The work is illustrated with pictures of towns, and portraits of the Viceroys taken, I believe, from pen and ink sketches by Correa himself. Most of the towns are fairly represented, though without accuracy of detail. For instance Aden, Diu, and Colombo, as they appeared in the sixteenth century, can at once be identified by any one who has seen them as they are now. Correa has been termed the "Polybius" of Portuguese History in India. Selections from his work, comprising the three voyages of Vasco da Gama, have been translated and published in English by the Hon. H. Stanley.

Joao de Barros, the Livy of Portuguese History. His work, in four Decades, though somewhat later than the histories by Correa and Castanheda was, until the last few years, universally regarded as the standard authority on the subject. The recent publication of Correa's Lendas raises the question whether Correa or Barros should be followed where discrepancies exist (and in detail such discrepancies are numerous); upon the whole it seems likely that Barros will always hold his place in the opinion of his own countrymen as well as in that of foreigners as the chief of Portuguese Historians. His style is admired, and he gives an interesting sketch of the Portuguese discoveries prior to Vasco da Gama's voyage, a necessary introduction, which Correa and Castanheda omit. Barros died in 1570. He never visited India, but had special facilities for his study as an official in the India Office at Lisbon.

Diogo de Couto, the continuator of Joao de Barros. De Couto served in India, and though his portion of the History is not considered equal to that written by Barros, it is the best we have for the latter half of the sixteenth century. The fourth Decade by Barros comes down to the death of Nuno da Cunha in 1539, but as this Decade had not appeared when De Couto commenced his continuation, he began twelve years earlier, bringing the continuation down to 1600. The joint History of De Barros and De Couto consists of twenty-four 8vo. Vols., there being for the reason above stated a duplicate account of the twelve years comprised in the governments of Lopo Vaz de Sampayo and Nuno da Cunha.

Castanheda. This historian came to India in 1528, and the eight books of his History were published between 1551 and 1561. They bring the narrative of Portuguese conquest down to the first siege of Diu in 1538, covering nearly the same period as De Barros. Castanheda intended to publish ten books, but the last two seem to have been suppressed, because they reflected on some of the grandees who had influence at Court. I cannot, however, say for certain that the last two books of Castanheda were never published. My own copy omits them, but from a list kindly given to me by Senhor da Cunha Rivara, Secretary to the Portuguese Government at Goa, it would appear that Castanheda's history is brought down to 1550. Castanheda is said to have travelled all over Portuguese India, with the laudable desire of testing and correcting his history.

Maffei, Historia Indicarum, a Latin history, based I believe on Barros. It is in one volume comprising sixteen books. It ends with the death of King John the Third in 1557, and is dedicated to Philip the Second. The author was a Jesuit; and attached to his principal work are four books of Epistolæ Indicæ, selected letters from India, a very valuable appendix.

San Romano, a Benedictine monk, wrote a History of the same period in Spanish. I have not seen this work, but believe it is founded on Maffei and is inferior to the original.

Fariay Sousa. His History was published in both Portuguese and Spanish. It embraces a more extended period than any of the others, beginning with the early voyages of discovery, and ending in 1640, at the eve of the Revolution which restored Portuguese independence. An English translation from the Spanish was published in 1695, with a dedication to Catharine, Queen Dowager, Charles the Second's widow.

For the sixteenth century, Faria y Sousa is an inferior authority to the earlier writers, but he is the one generally quoted by English authors, because his account is the most complete as well as the most easily read. I am surprised that the Library of the Asiatic Society at Calcutta does not contain a copy of the translation. The copy of the original in the public library at Goa seems to be imperfect. Faria y Sousa gives a list of the books and manuscripts from which he collected his information.

Lafitau, "Histoire des Découvertes des Portugais," in French, 2 Vols. There is a copy in the public library at Pondicherry, but not, I think, in our own library at Calcutta. I have not read this work through, but from a cursory examination, it seems like most French Histories to be readable and interesting. Lafitau names the authors he has consulted, and brings his narrative down to the same time as Faria y Sousa.

The above authors are all professed historians, who treat their subject generally. But history is usually more indebted to particular accounts,

memoirs, and personal narratives than to prolonged chronicles which are necessarily themselves compilations. This is especially true of Portuguese History in India. Passing on then to this class of authors we find—

"The Roteiro," the account of Vasco da Gama's voyage, followed by Mr. Major in his Life of Prince Henry. I have not seen this, but it is evidently a work of authority.

The Commentaries of the great Albuquerque, compiled by his son from the official despatches sent by Albuquerque to King Manuel. They appeared in 1557.

The Chronicle of King Manuel himself by Damiao de Goes, published during the reign of King Sebastian, and dedicated to the Cardinal Prince Henry.

The History of the Portuguese during the reign of Emmanuel, by Osorio, Bishop of Sylves, in Latin. This, though based on the Chronicle of Damiao de Goes, is superior to it as a literary work. There is an English translation, published in 1752.

Antonio Galvan, a contemporary of the Governor Nuno da Cunha, is said by Faria y Sousa to have written much concerning India and particularly about the Spice Islands, but Faria y Sousa was unable to find any of his works except "the Book he calls of Discoveries, which is only short hints of things." I presume this is the "Tratado dos diversos e desvayrados caminhos, &c." If any other works by this author are extant, they will be very valuable. Crawfurd eulogizes the author in the following terms: "Of all the Portuguese names connected with the Indian Archipelago incomparably the greatest, except of Magellan, is that of the virtuous, the pious, the discreet, and heroic Antonio Galvan." The failure of Faria y Sousa to find his manuscripts is no proof that they do not exist; for the instance of Correa's great History, to say nothing of numerous other books, shows that in Portugal the most valuable manuscripts may lie hidden for centuries.

I here insert a note by the editors of Correa's History, which details all the printed works prior to the date of that author.

"The printed Portuguese books regarding the History of India, of which Gaspar Correa might have had knowledge, although he may not have seen them all, still less possessed them, are,—the Life of D. Joao II., by Garcia de Resende; Castanheda's History; the three first Decades of Joao de Barros; the first book of the siege of Diu, by Lopo de Sousa Coutinho; the Commentaries of Albuquerque; the Itinerary of Antonio Tenreiro; the Book of Antonio Galvao, Tratado dos diversos e desvayrados caminhos, &c.; the Relation of the Embassy of the Patriarch D. Joao Bermudes; the Chronicles of the King D. Manuel and of the Prince D. Joao by Damiao de Goes; the treatise on the affairs of China by Fr. Gaspar de Crus; the

commentary of the siege of Goa and Chaul, by Antonio de Castilho; and some other which we have forgotten."

The Life of D. Joao de Castro, by Jacinto Freire de Andrade. This work has passed through several editions and is considered one of the Portuguese classics. The second siege of Diu by the King of Gujarát occurred during the Viceroyalty of D. Joao de Castro, and the defence and relief of the fortress are deservedly regarded by the Portuguese as among the greatest of their achievements. The edition of the "Life" published in 1835 contains valuable notes with selections from Castro's correspondence, among these are letters regarding Persian histories of Alexander the Great, probably the "Sikandarnámah," for which D. Joao de Castro, who was a man of literary as well as military ability, had sent. There is a work by D. Joao de Castro himself, the "Roteiro," giving an account of his voyage up the Red Sea in 1540.

The Chronicle of King John the Third; by Andrade, is another work thought very highly of by the Portuguese themselves.

There must be frequent references to Indian affairs in the Chronicles and Histories of other Portuguese and Spanish Monarchs, but the reigns of Emmanuel and John the Third were the "golden age" of Portuguese rule in India. Those of Sebastian and Philip the Second may be considered the "silver age," and subsequent reigns down to the capture of Cochin "the age of brass."

St. Francis Xavier was a contemporary of Don Joao de Castro; his life and work are so intimately connected with Portuguese India, that authorities regarding them may well be referred to here. Xavier's own letters are the best source of information regarding him. There is the old Latin edition of Tursellinus, and a modern French one by Léon Pagès. Of professed biographies, the most authentic is that in Portuguese by Lucena, and the most popular that in French by Bohours. Three recent biographies should also be consulted. First that by Venn, written from the Protestant standpoint. Second, a volume of Xavier's life and letters, published last year, 1872, by the Rev. H. J. Coleridge, an English Jesuit. (The second volume has not yet appeared.) Third, a Life of the Saint published at Goa in 1861, by Senhor Felippe Neri Xavier, Director of the National Press. This contains much miscellaneous information regarding Xavier and his tomb.

As Xavier is the Saint of Portuguese India, so is C a moens its Poet. The Lusiad is an authority in Portuguese History just as Shakespeare is for our own Plantagenets. National pride and patriotism pervade it, and great events which would be smothered in a mere chronicle of facts are brought by it prominently and picturesquely to view. There are many well known lives of Camoens, and many editions of the Lusiad in all large-pean languages. The Portuguese (I believe) regard the edition of the

Lusiad by D. José Maria de Souza Botelho with most favour. In English, Adamson's Life of Camoens, and Mickle's translation of the Lusiad are best known.

There is another Portuguese epic "Malaca conquistada," of which Albuquerque is the hero, but this has never attained general celebrity.

The Chronicle of Luis de Ataide, by Antonio Pereira. I have not seen this work, but it is quoted both by Faria y Sousa and by Lasitau. Luis de Ataide was twice Viceroy of India, in 1567, and again in 1578.

Diogo de Couto, the continuator of Barros, was a voluminous writer, and during his prolonged connection with Indian affairs (from 1556 to 1616) wrote many minor works besides his History. Among these are numerous orations to the incoming Viceroys. Also a Life of D. Paul de Lima, a celebrated Portuguese Captain, who died about 1589, and an interesting treatise called the "Soldado Pratico." I have not seen any of these works, but Mr. Stanley in the introduction to his "Three voyages of Vasco da Gama" gives an abstract of the "Soldado Pratico," which is a critique on the numerous defects of the Portuguese administration in India.

The Portuguese Missions to Akbar from 1582 to 1605 constitute one of the most interesting chapters in the History of Portuguese India. The account usually quoted is that by M. Manouchi, who was for many years Aurangzeb's physician. I have not seen his History, but it appears to have been published as a separate work. According to Hough, who devotes a chapter to these Missions, there are valuable manuscript accounts in the British Museum, some it seems in the original handwriting of the Missionaries. There are also narratives of the Mission in Murray's Asiatic Discoveries. There is an Italian account of Akbar and of the Jesuit Mission by Peruschi.

The close of the sixteenth century is remarkable in the annals of Portuguese India for the attempt to reconcile the heretical Syrian Church of Travancor to Rome. The chief authorities for this episode are Gouvea's Jornada do Arcebispo de Goa, D. Fr. Aleixo de Meneses as Terras do Malabar; Geddes, History of the Church of Malabar; La Croze, Histoire du Christianisme des Indes; Hough's Christianity in India; Lee's History of the Syrian Church, in one of the Church Missionary Society's Reports; Howard's Christians of Saint Thomas; Day's Cochin.

There are several other accounts, but the above contain all that is important. Day's Cochin is a valuable work generally, as Cochin was the most important Portuguese settlement in continental India next to Goa, and everything connected with it has some bearing on our subject.

While we are on the ground of ecclesiastical history, the following works may be named as in some way connected with Portuguese India, where formerly the predominance of ecclesiastical influence was so marked.

1878.]

The "India Orientalis Christiana" by Paukinus Bartholomaeus, said to be a work of great merit but very rare.

Francisco Sousa's "Oriente conquistado a Jesu Christo pelos padres da companhia de Jesus." This work was published in the beginning of the eighteenth century. It seems to be regarded by later Portuguese writers as an authority for secular as well as ecclesiastical history, and is, I presume, the work referred to in Cottinean's Sketch of Goa, page 21.

Bartoli's Asia. This, I believe, is the standard Jesuit authority, but there are numerous other histories of the Jesuits.

Historia das Inquisiçoes, published at Lisbon in 1821.

Historia da origem e establecimento da Inquisição em Portugal, by Herculano.

I have not seen the above works but the following which also have some bearing on the subject are to be found in the Public Library at Goa-

Tellez, Chronica da companhia de Jesus.

Luis de Sousa, History of the Dominicans.

Damian Cornejo, Chronica scraphica, or History of the Franciscans.

Pedro Monteiro, History of the Inquisition.

It may be observed that the Goa Library is chiefly composed of books which were taken from various convents when the monastic orders were suppressed. No doubt, it contains many other books of historical interest, which a hurried visit did not give me time to discover.

Faria y Sousa refers to a manuscript ecclesiastical History, called "The Spiritual Conquest in Asia," written by F. Paul of the Trinity, a Franciscan, in the year 1630. Probably this has since been printed.

For the seventeenth century printed authorities are rare. Faria y Sousa refers to a manuscript by Antonio Bocarro, apparently a continuation of De Couto, and also to accounts of Nuno Alvarez Botello and the Count de Linhares (1629 to 1635), the former in print, and the latter in manuscript. I suppose, it was the same Antonio Bocarro who wrote the description of the Fortresses of India, extracts from which have been published by Sr. da Cunha Rivara in the "Tissuary."

Mr. Stanley gives a summary of a manuscript found by him in the Library of Lisbon, entitled "History of the Elevation and Decadence of the Portuguese Empire in Asia," which gives some account of the seventeenth century.

Between 1640, the date at which Faria y Sousa closes his History (also the year in which Portugal recovered her independence), and 1668, the year in which Cochin was taken by the Dutch, there seems to be almost a blank so far as printed Portuguese authorities are concerned, but the deficiency is made good by an increased number of Dutch and French writers. The

ecclesiastical history of these few years is carried on by a Carmelite missionary, Vincenzo Maria, in his Viaggio all' Indie Orientali.

The expeditions, military and ecclesiastical, to Abyssinia; the rise and fall of Christianity in Japan; the rivalry with the Spaniards and Dutch in the Malay Archipelago; and the wars in Ceylon, may fairly be treated as episodes in the History of Portuguese India.

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Geddes, Church History in Ethiopia; La Crose, Christianisme d'Ethiopie; Ludolf's Historia Æthiopica.

Regarding Japan,—Kämfer's well known book is generally accepted as the best authority.

There is a work in Spanish "Christiandad del Japon," by Sicardo, of which there are copies in the public library at Goa. There are also collections of "Epistolæ Japanicæ," as of "Epistolæ Indicæ." The Rev. H. J. Coleridge states that M. Léon Pagès is about to publish a work on the subject.

The Chinese mission, though organised from Macao, was not so connected with politics as the Japan mission, and the early missionaries were mostly Italians not Portuguese. There is a description of China by Faria y Sousa, founded on the Memoirs of Semedo, and there is a separate account of the commencement of the mission under Ricci. There is also the great work of Du Halde.

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Regarding Ceylon, our information may be considered abundant and satisfactory. Sir Emerson Tennent devotes the first two chapters of his second volume to the Portuguese and Dutch rule, and refers to two Portu-

guese authorities who treat specially of Ceylon,—Ribeiro, and Rodrigues de Saa. The latter wrote an account of the expedition of 1630, in which his father was killed. There is also a Portuguese account of the siege of Colombo, translated and attached to Baldwus' narrative in Churchill's voyages. Baldaeus himself, a Dutch writer, is the best authority for the final struggle between the Dutch and Portuguese, giving a sketch of the negotiations and military movements, with details of the sieges of Colombo and Cochin and engravings of the different forts and towns. Ribeiro's History is contained in the fifth volume of the "Noticias para a Historia e Geografia das nacces ultramarinas." There is a French translation by LeGrand and an English translation, now rare, by Lee. Sir Emerson Tennent mentions Johann Jacob Saars, as giving in German an account of the campaign in which Colombo was captured. Wouter Schouten's "Oostindische Voyagie" is another narrative of the same period.

The above list does not include many "Travels," although the most vivid and faithful pictures of Portuguese India in the 16th and 17th centuries are to be found in the narratives of European travellers. The number of these is so great, that we can only specify a few, referring enquirers to the standard collections of voyages for further details. These collections are well known,—Ramusio, Purchas, Hakluyt, De Bry, Le Brun, Hulsius, Recueil des Voyages de la Compagnie des Indes Orientales des Pays-bas, La Harpe, Dampier, Harris, Pinkerton, Thevenot, Churchill, Astley, Lockman, Kerr, Murray, and others. There are two or three Italian collections of value besides Ramusio, and there are some Indian voyages in the Portuguese "Noticias."

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Odoardo Barbosa. The earliest description of India after Portuguese discovery.

The voyage of Magellau, which first took the Spaniards to the East.

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Travels of Pyrard de Laval (1601 to 1611). The original is in French, but there is a Portuguese translation, published at Goa by Senhor Rivara. Pyrard de Laval's book is of special value as he resided at Goa when the prosperity of that city was at its height; for although the glory of Portuguese India had begun to diminish some years earlier, the splendour of Goa as a city, was greatest during the first few years of the acceptant teenth century. Pyrard's description is detailed and interesting.

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Dellon's narrative of the Inquisition of Goa. The original was pub-

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lished in French in 1687, but there is a Portuguese translation, published at Goa in 1866 under the auspices of Sr. Rivara. This translation contains some valuable notes, and adds as an appendix the account of the Inquisition given by Dr. Claudius Buchanan in 1808 in the Christian Researches.

A narrative of the expedition against Ormus, when the Persians and English united to expel the Portuguese in 1622. This is contained in the collections by Purchas and Kerr.

Baldaus, the Dutch historian of the final struggle between Hollanders and Portuguese. The translation of his Travels is in Churchill's Collection.

Tavernier gives a description of Goa, a narrative of the persecution in Japan, a sketch of Dutch history in the East, and an account of the capture of Cochin. Altogether, Tavernier is a very valuable writer for our present purpose, as his information refers precisely to the period when Portuguese supremacy in India was disappearing.

There are numerous travellers a little later than Tavernier, whose narratives contain frequent references to the Portuguese. Among these may be named Bernier, Nieuhoff, Carreri, Fryer, and Hamilton.

Lastly, there is a modern account of Goa, written in English by the Rev. Cottenean de Kloquen and published at Madras in 1831. This contains a complete historical sketch of Goa from 1509 down to 1812, and gives a description of all the churches, convents, and other public buildings, accompanied by a map. It is, in fact, a modern guide to Goa. There is a Portuguese translation, which I have not seen. Probably the notes of the translation are of value, as it was published in Goa itself at a comparatively recent date (1858).

There is another modern account of the Portuguese possessions in Asia, by Gonçalo de Magalhaes Teixera Pinto, also published at Goa with notes by Sr. Rivara. It is a mere pamphlet, but it contains some official documents regarding the transfer of Bombay to the English.

As the Dutch were for sixty years the rivals of the Portuguese in Asia, it is reasonable to suppose that voluminous information may be collected from Dutch authorities. Besides the early Dutch voyages, and the travels of Baldæus already referred to, there is the great work of Valentyn, 'Oud en Nieuw Oost Indien.' Tennent refers frequently to this work. There is one copy in our own library at Calcutta, and there is another, wanting the first volume, at Madras. No doubt, a student acquainted with Dutch would find the works of numerous other authors at Batavia and Amsterdam.

It remains to notice official records and periodicals. I believe there are now few records of value at Goa. All that survived have been transferred to Lisbon, and are to be found there in the Torre do Tombo and other collections of Archives. But a very valuable work has been published at Goa

by Sr. da Cunha Rivara from the records of the 16th century. This work the "Archivo Portuguez oriental" is in five fasciculi, comprising altogether eight volumes. Of these, fasciculus No. 1 is out of print, the remaining seven volumes may be obtained from the Imprensa Nacional at Goa. The contents of the eight vols. are as follows:

Fasciculus 1, letters from the Kings of Portugal to the City of Goa.

Do. 2. Book of the privileges of the City of Goa.

Do. 3 (2 parts or vols). Letters and instructions from the Kings of Portugal to the Viceroys and Governors of India, and also charters and ordinances of the Kings and Viceroys.

Do. 4. The Ecclesiastical Councils held at Goa and the Synod of Diam-

par.

Do. 5. (3 parts). Various documents of the 16th century. Among these are important regulations regarding the administration of justice, the management of the Goa hospital, military and commercial matters. The references to the contemporary history of Muhammadan India are not very many. There are, however, some diplomatic documents referring to Bijápúr.

In the preface to his third fasciculus, Sr. da Cunha Rivara discusses an interesting question regarding some of the 16th century records. During the 16th and 17th centuries, the intercourse between India and Portugal was chiefly carried on by annual fleets to and fro, and the annual letters that they carried. As the arrival and despatch of the fleets were regulated by the monsoons, the registers containing copies of official letters were known as the 'Livros das Monçoens,' 'Books of the Monsoons.' At the time Sr. Rivara wrote his preface, the record rooms at Goa appear to have contained fragments of the "Livros" for the years 1568 and 1583, then a series from 1584 to about the end of the century, and then (after a gap of fifty years) a continuous series from 1651 to modern times. It was long believed that the absence of the "Livros" carlier than 1568 had been caused by the Marquis de Pombal, under whose orders sixty volumes of the series were despatched to Portugal in 1777. Sr. Rivara, however, proves that the sixty volumes so despatched, were those between 1606 and 1651, and that they at least are safely housed in the Torre do Tombo at Lishon. About the same time, and in obedience to the same order all the ecclesiastical records of an early date were also sent to Lisbon, but these, it seems, have been lost sight of.

I believe I am right in adding that the remaining "Livros das Mancoens" have been recently transmitted to Lisbon, since the publication of Sr. Rivara's Archivo. Possibly some of the missing records are to be found in our own British Museum; for Sir Emerson Tennent in the introduction to his "Ceylon" writes—" Within the last few years, the Trustees of the British 204

Museum purchased from the library of the late Lord Stuart de Rothesay the diplomatic correspondence and papers of Sebastiao Jozé Carvalho e Mollo (Portuguese Ambassador at London and Vienna, and subsequently known as the Marquis de Pombal) from 1738 to 1747, including sixty volumes relating to the history of the Portuguese possessions in India and Brazil during the 16th, 17th and 18th centuries. Amongst the latter are forty volumes of despatches relative to India entitled Collegam Authentica de todas as Leys, Regimentos, Alvarás e mais ordens que se expediram para a India, desde o establecimento destas conquistas. Ordenada por proviram de 28 de Marco de 1754. Mss. Brit. Mus., Nos. 20,861 to 20,900."

The "Archivo" is so far defective that it only gives the outward despatches and letters from Lisbon to Goa together with other documents issued in In lia. It does not give despatches from Gor to Lisbon, which would be of yet greater value to the student of Indian History. I cannot gather from Sr. Rivara's preface to the third fasciculus where these are, nor does be expressly state that the early "Livros das Monçoens" are lost beyond recovery. Perhaps the introduction to his first fasciculus, which I have not been able to obtain, throws some light on these points. This much is certain. The Torre do Tombo and other libraries at Lisbon contain a number of valuable records of both the 16th and the 17th century, though it would seem from the preface to "Gaspar Correa" that they are not valued as they deserve to be. I must add that Sr. Rivara's "Archivo," though richer towards the end, contains a great many documents belonging to the early part of the 16th century. The early "Livros das Monçoens" have been lost, but there were other early records which Sr. Rivara by publication has saved from a similar tate.

Many articles of historical and antiquarian value have been published in the "Boletim do Governo," the "Government Gazette" of Portuguese India. Among those of recent numbers may be enumerated the "Capitulos de um livro inedito," containing information as to ecclesiastical matters in the 17th century, and a series of Treaties of the same period. Many similar articles are scattered through back numbers of the Boletim, including, I believe, an account of the records by Sr. Felippe Neri Xavier. I hope Sr. Rivara, under whose auspices the majority have been published, will collect and republish these papers in a separate form. It is much to have saved ancient records from destruction, but the service to History will be enhanced by republication. Papers are not readily accessible when scattered through the old files of a Gazette.

I may mention here that Sr. Rivara in addition to the numerous publications above referred to, is the author or editor of several other important works more or less connected with our present subject; among these an historical essay on the Concan, or dialect, of Goa; a dictionary and grammar of the same; a publication regarding village communities; and several regarding the ecclesiastical rights of the Crown of Portugal and the Archbishop of Goavexed questions among the Roman Catholics of India.

Two facts regarding other records may be added from Day's Cochin.

- 1. The Dutch Government records of Cochin are, it seems, still there, and apparently the early volumes refer to the capture, or to the period immediately following the capture, from the Portuguese (page 121).
- 2. The records of the Verapoly Monastery were lost in the river, as the priests were endeavouring to carry them away from Tippu's troops in 1790 (Chronology at end of book).

So far I have only referred to European accounts of Portuguese India, but what Indian authors are there on the subject? Hindús, who care so little for history, are not likely to give us much help, but it is different with Muhammadans. They are given to chronicle writing, and we may fairly expect some account of the Portuguese from them. As yet, however, I have not found any special Muhammadan history on the subject, except the "Tuhfat ul Mujahidin." This is a valuable work, as it describes the wars of the Portuguese and Muhammadans between 1495 and 1553, from a Muhammadan point of view. There is an English translation, No. 30, in the series of the Oriental Translation Committee.

Firishtah must be consulted, because his histories of the Dakhin States are so full, and refer specially to the period when the Portuguese power was at its height. The eleventh chapter, on the Muhammadans in Malabar, is founded on the Tuhfat ul Mujahidm. Besides this, Briggs gives in an appendix an epitome of the wars of the Portuguese in India. But Firishtah's allusions to the Portuguese, except in the eleventh chapter, are very meagre. He gives a brief account of the death of King Bahadur, and of the siege of Chaul by Burhán Nizam Sháh in 1592, but he does not even mention the great siege of Díu. Still the constant references to the Muhammadan kings by Portuguese historians, and the constant intercourse that must have gone on between the Orientals and the European invaders, render it necessary to consult Firishtah.

Next to Firishtah may be mentioned the Mir-át i Ahmadí, with its translation by Bird, and the Mir-at i Sikandarí, on which the Mir-át i Ahmadí was founded.

Firishtah's History of Bijápúr was prematurely closed in 1596, while we seek for information down to 1663. The following supplementary histories of the Dakhin states and particularly of Bijápúr, the one that had most dealings with Goa, are described in Mr. Morley's list of the historical manuscripts preserved in the Library of the Royal Asiatic Society.

Tazkirah i Ahwál i Salátín i Bíjápúr, composed in 1806 from two carlier historics of the 'Adil Sháhí dynasty. Morley describes this work as concise, but valuable.

Basátín us Salátín. This is also a modern manuscript (1824), but the preface enumerates the authorities from which it was compiled.

Muntakhab i Tawáríkh i Bahrí, containing a history of the Nizámsháhí dynasty.

Táríkh i Sultán Muhammad Qutbsháhí, a history of the Qutbsháhí dynasty of Golkonda; an abridgement of this is also given in Brigg's Firishtah. Mr. Bird in his account of Bíjápúr refers to another history the "Táríkh i Haft kursi" and also to the "Táríkh i Asad Khání," which he appears to consider as the same work under a different name. He says that the "Tárikh i Haft kursi" was written in the reign of 'Alí 'Adil Sháh II. (1656 to 1672).

I have not seen any of these manuscript histories of the Dakhin states, but mention them as to some extent bearing on the subject. The names given by Portuguese authors are frequently unintelligible until compared with Persian accounts. But it is not likely that any of these histories give more than casual allusions to the Portuguese.

Passing from the Dakhin to the Mughul histories-

The Tabaqat i Akbarí contains a few references to the Portuguese, including an account of King Bahádur's death. It refers also to the construction of the Súrat fort against the depredations of the Portuguese.

The Akbarnámah refers to King Bahádur's death, and gives some account of the Jesuit missions at Akbar's court. Probably it contains other references to the Portuguese, but I have not yet examined the Akbarnámah. I hope Mr. Blochmann, who is so well acquainted with the Persian histories of this period, will add some further account of these references. The Inshá i Abulfazl contains a letter from Akbar, a translation of which is given by Hough in his second volume, page 261. This is said to have been intended for the King of Portugal, but the address in my copy of the Inshá is "Danáyán i Farang," as though intended for the Jesuits.

The Muntakhab ul-tawarikh of Badaoni also refers to Diú and to the Jesuit missions at Akbar's court. Mr. Blochmann's extracts, attached in a note to the 77th Kin, read with the Jesuit account, give a vivid picture of Akbar and his court.

The Dabistán contains an account of the Christian religion derived from the Portuguese priests, and gives a sample of the discussions before Akbar.

The Tuzuk i Jahángíri alludes in several places to Muqarrab Khán and to Súrat affairs. One passage appears to refer to the attack by Azevedo on Downton's ships in 1614. Elsewhere the Tuzuk refers to presents from the Portuguese and to some Portuguese in Jahángír's employ.

The Padishahnamah, page 483, Vol. I, gives a detailed account of the siege and capture of Hughi. Farther on, this is again referred to in letters to Nazr Muhammad Khan, the ruler of Balkh, and to the Shah of Persia. At

page 534, the fate of the captives is described. In the second volume, there is an account of the Portuguese at Chittagong.

Kháfí Khán, the most useful of the Muhammadan historians after Firishtah, also gives an account of the siege of Húglí, prefixing to it an interesting description of the Portuguese from his point of view. A fuller description is found in the second volume, page 400, reign of 'Alamgír.

Mr. Blochmann, to whom I am indebted for several of the above references, tells me that the Portuguese are frequently mentioned in the Maisir ul Umará, a work containing biographies of the great men of the Mughul empire, and that there are occasional bigoted allusions to them in the Farhang i Rashidi, a Persian dictionary written in 1653.

A certain amount of information is scattered through different periodicals. No. 3 of the Calcutta Review contains an article on the Jesuit missions; No. 10, the Portuguese in North India; No. 51, the Shiry Family; No. 57, the Inquisition at Goa; No. 77, the Life of Xavier; Nos. 102 and 103, Topography of the Mogul Empire; No. 105, the Feringhees of Chittagong.

The Asiatic Researches contain articles on Malabar; The Syrian Christians; Nobili's imitation of the Veda; and Bíjápúr.

The Bengal Asiatic Society's Journal is singularly deficient in articles bearing on our subject. The volume for 1841 mentions the Portuguese in connection with Arakan. That for 1843 contains an interesting account of Abyssinia, and the Portuguese missions there, and the volume for 1844 contains an article called "Political events in the Carnatic from 1864 to 1687," which may be considered to have a distant connection with the contemporary history of Portuguese India. There is also a modern account of Socotra, but so far as I have seen, there is not a single article devoted specially to Portuguese Asia.

The Journal of the Royal Asiatic Society is as deficient as our own in this respect. I cannot find a single article specially devoted to Portuguese India, but the following appear to have a distant bearing on the subject; Vol. II, Transactions, Diplomatic relations between the courts of Delhi and Constantinople, in the 16 and 17 centuries. Vols. I and II, Journal, Memoir on the Sprian Christians; Vol. II, Sca ports on the coast of Malabar; Vol. V, (or VI, ?) account of the Sherley family; Vol. VII, Tribes of the Northern Concan; Vol. V (new series), on Malabar, &c.

The last series of the "Journal Asiatique" gives no help. I have not seen the earlier series. We might expect more assistance from Bombay, as that Presidency has been always intimately connected with Portuguese India. But so far as I have ascertained, there is not much. Vol. II of the Bombay Literary Transactions contains a Turkish account of a naval expedition in the sixteenth century with references to the Portuguese. I have not seen Vol. III., but I believe it contains a description of Bijapur, and

possibly some other articles connected with the subject. I believe there are some articles in the Journal of the Bombay Geographical Society. The Journal of the Bombay Asiatic Society contains (1841) Translations from De Couto; (1842) Bird's description of Bijápúr; (1849) Maráthi works composed by the Portuguese; (1868) Translations of Portuguese Inscriptions found at Bombay.

• The Bombay Quarterly Review, vol. 4, contains an interesting article by the late Mr. Anderson regarding the capture of Bassein and other Portuguese forts between Bombay and Daman by the Maráthas. This, however, was in the eighteenth century, and our present review does not extend to a later date than 1663.

Doubtless there are numerous articles scattered through the Journals and Proceedings of the various Societies at Madras, Singapore, Batavia, Amsterdam, and Lisbon, but these I have not yet examined.

More valuable than most of the above, for our present purpose, is the "Chronista de Tissuary," a periodical which appeared at Goa under the editorship of Sr. Rivara, between 1866 and 1869. Every article in this is of value, though many refer to a period in the history of Portuguese India later than that under review. It contains among other papers an account of transactions with 'Adil Shah, treaties of peace with Jahángír and Sháh Jahán, descriptions of the Portuguese fortresses as they were in 1634, and notes of the inscriptions existing at the present day. Copies of the inscriptions with which the fortress of Díu is covered, have been published by Sr. Rivara in a separate pamphlet.

The "Gabinetee Litterario das Fontainhas" appears to have been a similar periodical of earlier date. This statement, however, is subject to correction, as I have not seen the "Gabinetee Litterario."

The above summary of authorities regarding Portuguese India has been prepared, partly from a list given me by Sr. Rivara, partly from Faria y Sousa, and partly from other books in my possession. Sr. Rivara who is a member of the Bombay Asiatic Society, will be able to enlarge the list and to correct any details that may be faulty where Portuguese authors are referred to. I hope he will do me this favour, and if Mr. Blochman will kindly render the same service where Muhammadan authors are quoted, or where other information may be available in the Society's Library, it will be a great assistance to students interested in the subject.

1873.]

Contributions to the Geography and History of Bengal (Muhammadan Period).—Part I., Geographical.—Part II., Historical, based on Inscriptions received from General A. Cenningham, C. S. I., Dr. J. Wise, E. V. Westmacott, Esq., W. L. Heeley, Esq., Walter M. Bourke, Esq., &c., and on unpublished coins, with notes by E. V. Westmacott, Esq., and Dr. J. Wise.—By H. Blochmann, M. A., Calculta Mudrasah.

In the end of last year, General Cunningham, Director of the Archæological Survey of India, forwarded to the Asiatic Society, for publication in the Journal, a unique collection of rubbings of Muhammadan inscriptions from Bengal and various places up-country, and in the Proceedings of our Society for January last, I gave an account of the importance of these rubbings with reference to the history of Bengal. Dr. J. Wise of Dacca, Mr. Walter Bourke, Mr. E. V. Westmacott, C. S., and Mr. W. L. Heeley, C. S., have also favoured the Society with valuable rubbings and notes on the localities where they were obtained, and I shall delay no longer to carry out the wishes of the donors and publish my readings with a few notes suggested by the subject. I have also examined our coin cabinet, which I found to contain some unpublished Bengal coins of great value.

The importance of mural and medallic evidence for Bengal History arises from the paucity and meagreness of written sources. Whilst for the history of the Dihli Empire we possess general and special histories, often the work of contemporaneous writers, we have only secondary sources and incidental remarks for the early Muhammadan period of Bengal, i. e., from A. D., 1203 to 1538. Nizamuddin Ahmad, who served Akbar as Bakhshi. the friend and protector of the historian Badáoni, is the first writer that gives in his Tabagát i Akbarí, which were completed in 1590. a short connected account of the independent kings of Bengal from 1338 to 1538. For the time between 1203 and 1338, we depend on incidental remarks made by Dihlí writers, as Minháj i Siráj, Baraní, and 'Afif. Firishtah. who flourished in the beginning of the 17th century, has a chapter on the same period as Nizám; but though he gives a little more, it seems that he used the same, at present unknown, source as the author of the Tabagat i Akhari. But there can be no doubt that this source was a work defective in chronology and meagre in details. Firishtah also cites a historical compilation by one Háji Muhammad of Qandahár, of which no copy is at present known to exist.

The latest writer on Bengal History is Ghulam Husain of Zaidpur, poetically styled 'Salim,' who composed his Riyazuesalata, or 'the Gardens of Kings,' at the request of Mr. George Udney of Maldah. This work, the

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title of which contains in the numerical value of the letters the date of its completion (A. H. 1202, or A. D. 1787-88), is rare, but is much prized as being the fullest account in Persian of the Muhammadan History of Bengal, which the author brings down to his own time. From a comparison of his work with that by Firishtah, it is evident that for the early portion he has used books which are likewise unknown at present, and it is unfortunate that his preface gives no information on this point.* His additional source, it is true, cannot have been a work of considerable size; yet he gives valuable dates which, as will be seen below, are often contirmed by collateral evidence. Salim has also made a fair use of the antiquities of the Gaur District. Stewart, who used the Riyáz as the basis of his History of Bengal, has given a translation of the greater part of the work; but from a leaning to Firishtah he has left out useful passages, which will be found below.

A commentary on Inscriptions necessarily contains references to the history and the geography of the country; but in order not to overload the subject with unconnected remarks, I have, in the following, separated the geographical from the historical portion, and have thus found means to collect, in a convenient way, numerous stray notes which for several years have been accumulating in the course of my historical studies.

When quoting this unknown source, Salim uses phrases as 'd to residal e diletano,' 'I have seen in some pamphlet,' or 'I is peak,' 'according to another statement,' &c.

The Asiatic Society Library has one MS, of the Riyazussalátín (No. 526), written in bold shikustah, 277 pages, 8vo., 15 lines per page, copied in 1851 at Hajppúr by one Sadruddin Ahmad. Beginning—Juhán pahán hand sezúvár chárjáh epuhán-átrána ast, kih ín mazáhar ekondezá hasyad equalact eká adah ekharish hashiyah i vajjád agakalla sákhtuh, ác. The work consists of a Preface in four parts, and four Chapters, of which the last contains two parts. The end contains the following description of the character of the "new rulers"—

"The English among the Christians are adorned with the head-dress of wisdom and skill, and ornamonted with the garb of generosity and good manners. In resolution, activity in war, and in festivities, in administering justice and helping the oppressed, they are unrivalled; and their truthfulness is so great, that they would not break a promise, should they even lose their lives. They admit no liar to their society, are pious, faithful, pitiful, and honorable. They have neither learnt the letters of deceit, nor have they read the page of vice; and though their religion is opposed to ours, they do not interfere with the religion, rites, and propagation of the Muhammadan faith.

گفتگوی کفر و دین آخر بیکجا میکشد 👚 خواب یك خواب است باشد مختلف تعبیره^ا

All wrangling about faith and heresy leads to the same place: the dream is one and the same dream, though the interpretations may differ."

PART I.—GEOGRAPHICAL.

Before the conquest of Bengal by the Muhammadans under Bakhtyår Khiljí in A. D. 1203, Bengal is said to have been divided into five districts—
(1) Rádha, the country west of the Húglí and south of the Ganges;
(2) Bagdi, the delta of the Ganges; (3) Banga, the country to the east of, and beyond, the delta; (4) Barendra, the country to the north of the Padma (Podda) and between the Karataya and the Mahánandá rivers; and (5) Mithilá, the country west of the Mahanandá. We do not know whether these names refer to revenue districts, or merely indicate (as they now do) popular divisions based upon the course of principal rivers; but as the different orders of Bráhmans and Káyasths take their distinctive names from these divisions, it may be assumed that they existed or were recognized at the time of Ballala Sen, who classified the two castes.

The ease with which Bakhtyar Khilji took possession of Bengal by his surprise of Nadiya,* the then capital, stands unparalleled in history, unless we compare it with the almost peaceful transfer of the same country. five hundred and fifty-five years later, from the Muhammadans to the East India Company. But it would be wrong to believe that Bakhtyár Khiljí conquered the whole of Bengal: he merely took possession of the south-eastern parts of Mithilá, Barendra, the northern portions of Rádha, and the northwestern tracts of Bagdi. This conquered territory received from its capital the name of Lak'h naut, and its extent is described by the author of the Tabagát i Nágirí, who says that the country of Lak hnauti lies to both sides of the Ganges and consists of two wings; the eastern one is called Barendra. to which Dookot belongs; and the western has the name of Ral fi. s., Rádha', to which Lak'hnúr belongs. Hence the same writer also distinguishest Lak'hnauti-Deokot from Lak'hnauti-Lak'hnur. From the town of Lak'hnautí to Deokot on the one side, and from Lak'hnautí to the door of Lak'hnur, on the other side, an embanked road (pul) passes, ten days' march. Distinct from the country of Lak huauti is Banga (digár i Bana. Bangadesh, Tabaqat, p. 267), and in this part of Bengal the descendants of the Lak'hmanivah kings of Nadivá still reigned in A. H. 658, or 1260, A. D., when Minhaj i Siráj, the author of the Tabaqat, wrote his history. I Deokot. which still gives name to a large parganah, was correctly identified by Buchanan with the old fort near Damdamá, on the left bank of the Púrná-

^{*} Lak'hman Sen, the last king of Bengal, though called king, cannot have been much more than the principal zamfudár of his time "He was a liberal man," says the author of the Tabaqát, "and never gave less than a lak'h of cowries, when he made a present - may God lessen his punishment in hell!"

[†] Tahaqát, pp. 162, 242.

[†] Tubuqát Nácirí, p. 151. Thus an expedition against Banga by the governor of Lak'hnanti is mentioned in 657. Tubuqát Nácirí, p. 267.

bhaba, south of Dinájpúr. Close to it lies Gangarámpúr with its ruins, and the oldest Muhammadan inscription known in Bengal.* Lak'hnúr,† the town or 'thanah' of the other "wing," has not yet been identified. The name occurs in no Muhammadan history after the time of the Tabaqát i Náçirí, and the only hint given is, that it lay west of the Húglí, on the road, at about the same distance from Lak'hnautí city as Deokot lay from the capital—which would be the northern portion of District Bírbhúm.

Minháj's remark that Banga was, in 1260, still in the hands of Lak'hman Sen's descendants, is confirmed by the fact that Sunnárgáon is not mentioned in the Tabaqát; nor does it occur on the coins of the first century of Muhammadan rule. It is first mentioned in the Túríkh i Baraní as the residence, during Balban's reign, of an independent Rái; but under Tughluq Sháh (A. D. 1823), Sunnárgáon and Sátgáon, which likewise appears for the first time, are the seats of Muhammadan governors, the term 'Bangálah' being now applied to the united provinces of Lak'hnautí, Sátgáon, and Sunnárgáon. I

The Tarikh i Barani, the Tarikh i Firúzsháhi by 'Afif, and the Travels of Ibn Batútah yield but little additional information. Firúzabád, or Panduah (north of Máldahá, or Máldah) which General Cunningham significantly calls 'Hazrat Panduah,' or 'Panduah, the Residence,' appears as the new capital, and in connexion with it Fort Ekdálah, said to be 'near Panduah.' The actual site of this fort is still a matter of doubt; even the

- * Of Kai Káús Sháh, A D. 1297. Journal, A. S. B , 1872, Pt. I., p. 102.
- † Major Raverty, of whose translation of the Tabaqát two fasciculi have just appeared, informs me that all his bost MSS. have على للمعاول , Lak'hnúr. The Bibliotheca Indica edition has الكونول, and often also ; and it was, no doubt, the last spelling that led Stewart to substitute Nágor (in western Bírbhúm), which certainly lies in the direction indicated. Outside of the Marátha wall of Nagor, we have a Lak'hípúr and a Lak'hínáráyanpúr.
- ‡ Baraní, p. 452. He spells Satgáon, not Sátgáon. It is almost useless to remark on the geography of Bengal as given in the Tabaqát before the appearance of Major Raverty's translation, who has collated nearly all existing MSS. of the work. The Bibliotheca Indica edition is untrustworthy. Taking it, however, as it is, we find the following places mentioned—Núdiyah, in this spelling, for Nadiya's, Lak'hnauti; Banga; Bál (Bádha); Barendra; Lak'hnaur; Deokot; Narkotí (?), منازوتي المعاورة (?), p. 158; المناوري (?), p. 158; bangáon, p. 153; Fort Bishnkot, founded by Husamuddín 'Iwas near Lak'hnautí, pp. 180, 243. Besides these, a few places are mentioned on the frontiers of Bengal, as Kámrád (always with this spelling) for Kámráp; مواد سناوري (?), p. 263; and Jájnagar, regarding which vide below.

The Táríkh i Firishtah furnishes the isolated fact of the foundation of Rangpár by Bakhtyár Khiljí on the frontier of Bengal (Lucknow Edition, p. 198). author of the Riyazussalatin, who lived in the neighbourhood of Matah and Panduah, says nothing about it.

About 850 A. H. (A D. 1446), during the reign of Naciruddin Rahmud Shah, the capital was transferred to Gaur. Thus Lak'hnauti is henceforth again called in history. The transfer, though it may have been connected with the restoration of an old dynasty, was unfortunate. Gaur lies in the middle between the Ganges and the Mahananda, thus occupying, as is the case in all Deltaic lands, the lowest site; and east of it lies the Kallak Sajamarsh, called in the Ain Chuttia-pattia, into which the drainage of the town opened. Every increase in the waters of the Ganges caused the marsh, which is connected with it, to rise, and "if the [carthen] embankment broke, the town was under water,"† and the drainage was driven back into the town. Hence the removal of the capital, a short time afterwards, to Tindah,‡ and the ultimate desertion of the town as a fever centre for Rajamahall.

The meagre information supplied by the Tabaqát i Nizámí and Firishtah throws no further light on the geography of Bengal, but leaves the impression that during the reigns of the independent kings (A. H. 739 to 914, or A. D. 1338 to 1535) the extent of Muhammadan Bengal was the same as what we find it in A. D. 1552, the year in which Todar Mall prepared his rent-roll of Bengal, a copy of which Abul Fazl has given in the Aín.

The coins and inscriptions of the above period yield a few particulars. We have the seven Bengal mint towns given by Thomas, \$\fo\$ to which I can

- * Mr. Thomas compares with Ekdálah the name of 'Jugdula,' a village east of Hazrat Panduah, towards the Púrnábhaba. The Indian Atlas Sheet No. 119 also mentions a village Jazdal due north of Máldahá, near the Mahánandá, in Las. 25° 17' 30", and a 'Jugdul' and a 'Jugdul' will be found south-east of Gaur, Long. 88° 28', Lat. 24° 42. Evên in other parts the name is common; for Jagdal is the Bangálí 'Jogoddul,' 'a leaf of the world,' the world being the lotus, and each town a petal of it. Another Ekdálah will be found on the same sheet, south-east of Bogra (Bagurá), Long. 89° 40' 30", Lat. 21° 35' 15", and a third is in Rájaháhí, a little south-west of Nátor. The name seems to be the Bangálí 4557, 'having one wing;' and Dodalá 'having two wings,' occurs likewise as a name of villages.
 - + Kin i Akbari.
- ‡ Rennell marks 'Tarah' near the Pagla River (a branch of the Ganger and perhaps the old bed of the river), south-west of the fort of Gaur. "Tanda standath from the river Ganges a league, because in times past the river flowing over the bankes, in time of raine did drowne the countrey and many villages, and so they do 'remaine. And the old way the river Ganges was went to run, remaineth drie, which is the occasion that the citie doeth stand so farre from the water." Raiph Fitch.

The losses of Akbar's Bengal army in Gaur will be found in my Kin translation, p 376.

§ Lak'hnautí, Firúsábád (Papduah), Sátgáon, Shahr i Nan (?), Sharispár, Sunnárgáon, and Mu'assamábád. Ohronicles, p. 151.

now add three more, viz. Fathábád, Khalífatábád, and Husainábád, which will be discussed below. The inscriptions reveal the important fact, that Bengal was divided into revenue divisions called Mahalls, over which, as in the Dihli empire, Shiqdárs* wêre placed, and into larger circles under 'Sarlashkars,' or inilitary commanders, who have often also the title of Vazir (Díwan). Of places mentioned on inscriptions I may cite—Iqlim Mu'azzamábád (Eastern Maimansingh); Thanah Laúr (north-western Silhat,—both occur also united under the same Sarlashkar); Sarhat, in western Bírbhúm, now in the Santal Parganahs; Láopallah, east of the Island in the Húgli opposite Tribení Ghát, evidently in olden times an important place as lying at the point where the Jabuná leaves the Húgli and commences her tortuous course, first casterly, then southerly, into the Sundarban; † and also several places which have not yet been identified, as Simlábád, Hádígarh, and Sájlá-Mankhbád. ‡

From the middle of the 16th century we have the works and maps of Portuguese historians, notably the classical 'Da Asia' by Joao de Barros (died 1570); and the graphic descriptions of Cosar Frederick (1570) and Ralph Fitch (1553 to 1591). Nor must 1 forget the Persian traveller Amín Rází, an uncle of Núr Jahán, who composed his 'Haft Iqlím' in A. H. 1002 (A. D. 1591); but it is doubtful whether he visited Bengal, or merely wrote down what he heard at Agrah. I shall occasionally refer to the works of these travellers below.§

But by far the most interesting contribution to the geography of Bengal, in spite of the unsatisfactory state of the MSS., is Todar Mall's rent-roll. Though of 1582, it may be assumed that Todar Mall merely gave in it what he found to exist with regard to both divisions and revenue; for Bengal was only subjugated during Jahángír's reign, and properly assessed

- * How extensively the Bindús were employed as revenue officers may be seen from the fact that the Arabic-Persian Shiqdár and Majanu'alalár have become Bangalí family names, generally spolt 'Sikdar' and 'Mozoondar.'
- † The island opposite Triboní has a conspicuous place on De Barror' Map of Bengal and on that by Blaov (ride Pl. IV.). The maps also agree with Abul Fazl's statement in the Kiu, that at Tribeni there are three branches, one the Saraswatí, on which Sátgáon lies; the other, the Ganga, now called the Húglí; and the third, the Jon or Jabuná (Jamuná). De Barros and Blaev's Maps shew the three branches of almost equal thickness, the Saraswatí passing Satigam (Sátgáon), and Chouma (Chaumuhá in Húglí District, north), and the Jabuná flowing westwards to Buram (Borhan, in the 24-Parganaha).
 - 1 Journal, A. S. Bengal, 1870, Pt. I., p. 284.
- § I have not mentioned Nicolò de Conti's Travels (1419 to 1414, A. D.), because he only mentions one town in Bengal, Carnove on the Ganges, which Col. Yule has identified with the 'Shahr i Nau,' or 'New Town' on Sikandar Sháh's coin of 1379 (Thomas, In. Coinage of Bengal, Journal, A. S. Bengal, 1867, p. 65); but the position of this town is still a matter of doubt.

by Prince Shujá' a short time before 1658. In the Kín we find that Bengal proper was divided into 19 Sirkárs, and 682 Mahalls. Eight of the 19 Sirkárs, and 204 of the 682 Mahalls, have Muhammadan names. The rent-roll included both the kháliçah ('genuine,' vulgo khalsa) or crownlands, and the aqtá or jágír lands, i. c. lands assigned to officers in lieu of pay or maintenance of troops. The distribution of the Sirkárs depended, as in the old Hindú division, on the courses of the Ganges, Bhagirathí, and Megna, or, as the Kín expresses it, on the courses of the Padmáwatí, Ganga, and Brahmaputra, as will be seen from the following list of the Sirkárs.

A. Sirkars North and East of the Ganges.

- 1. Sirkár Lak'h nautí, or Jannatábád, extending from Taliágarhí (K'halgáon, Colgong) along the northern banks of the Ganges, and including a few mahalls now belonging to district Bhágalpúr and Púrniah, and nearly the whole of Máldah district. Besides Gaur, this Sirkár contained the ancient town of Ráugímatí.* 66 mahalls; khalsa revenue, Rs. 471,174.†
- 2. Sirkar Púrniah, or Púrnuiah, the greater and chiefly westerly portion of the present district of Púrniah, as far as the Mahánanda. \$\frac{1}{2}\$ 9 mahalls; revenue Rs. 160,219.
- 3. Sirkár Tájp úr, extending over Eastern Púrniah east of the Mahánandá, and Western Dínajpúr. 29 mahalls; revenue, Rs. 162,096.
- 4. Sirkár Panjrah, so called from the Haweli mahall Panjrah, north-cast of the town of Dinájpúr, on the Atrai River, comprising the greater part of Dinájpúr district. 21 mahalls; revenue, Rs. 145,081.
- 5. Sirkár G'horág'hát, so called from the town of G'horág'hát or Chauk'handí on the right bank of the Karatayá, comprising portions of Dínájpúr, Rangpúr, and Bagurá (Bograh) districts, as far as the Brahmaputra. Being a frontier district towards Koch Bihár and Koch Hájo, it contained numerous jágír lands of Afghán chiefs and their descendants. The Sirkár produced a great deal of raw silk. 88 mahalls; revenue, Rs. 202,077.§
- 6. Sirkár Bárbakábád, so called from Bárbak Sháh, king of Bengal (vide below), and extending from Sirkár Lak'hnautí along the Podda to Bagurá. It comprises portions of Máldah and Dínajpúr, and a large part of Rájsháhí, and Bagurá. Its cloths were well known, especially the stuffs
- * Máldah is once mentioned in the Tuzuk i Jahángírí (p. 178)—" When I [Jahángír] was prince, I had made a promise to Mír Ziyáuddín of Qazwín, a Saifi Sayyid, who has since received the title of Muçtafá Khán, to give him and his children Parganah Máldah, a well known Parganah in Bengal. This promise was now performed (A. D. 1617).
- † Akbarsháhi Rupees (1 Rupee = 40 dáms). Grant substitutes 'Sicca Rupees,' at 2s. 3d.
- ‡ It seems as if the Mahánandá, in its upper course, is often called Mahánadí. Van den Broucke calls it on his map 'Martnado.'
 - § Some MSS, have 209,577 Rs.

called kháçah (the "koses" of old writers) as the kháçah of Shahbázpúr, the çahan (¿), the 'sanes,' or 'sahnes' of Dutch writers), and the múminí. 38 mahalls; revenue, Rs. 436,288.

- 7. Sirkár Bázúhá, extending from the preceding across the Brahmaputra into Silhat, comprising portions of Rájsháhí, Bagurá, Pabná, Maiman Singh, and reaching in the south a little beyond the town of Dháká (Dacca).* The name 'Bázúhá' is the plural of the Persian word bázú, 'an arm, a wing;' and all mahalls in this Sirkár have the word bázú after their name, which on our survey maps appears under the Bangálí form 'Bajoo.'† 32 mahalls; revenue, the largest of all Sirkárs, Rs. 987,921. To this Sirkár belonged Dháká, and Sherpúr Murcha, or Mihmánsháhí, south of Bagurá on the Karataya, which is several times mentioned in the Akbarnámah as a military station.
- 8. Sirkár Silhat, adjacent to the preceding, chiefly east of the Surmá River. As will be seen below, the country was only conquered by the Muhammadans in the end of the 11th century, and was exposed to continual invasions from Tiparah and Asám. According to Marco Polo, the Ain, and the Tuzuk, Silhat supplied India with cunuchs. Jahángír issued an edict forbidding the people of Silhat to castrate boys. Like Kámrúp, Silhat is also often mentioned as the land of wizards and witches, and the fame of its jádú, or witcheraft, is still remembered at the present day. 8 mahalls; revenue, Rs. 167,032.
- 9. Sirkár Sunnárgáon, to both sides of the Megna and the Brahmaputra, containing portions of western Tiparah, Bhaluá, and Noák'hálí, subject to repeated attacks by the Rajahs of Tiparah and Arakan. 52 mahalls; revenue, Rs. 258,283. The *Haft Iqlim* gives Rs. 330,000.
- Stewart says that Dháká is a modern town, "because the name does not occur in the Ain." But it does; vide my text edition, p. 407, where the Mahall to which it bolongs, is called Dhakká Bázú. In Gladwin's spelling 'Dukha Bazoo' it is, however, scarcely recognizable. Dháká occurs in the Akbarnámah as an Imperial thánah in 1584; and Sir A. Phayre (rule above, p. 53) mentions it in 1400.
- † Thus the country west of Pabna is called 'Bajooras' and east of it 'Bajoochup' —corruptions of Bázú i rást, 'the right wing,' and Bázú i chap 'the left wing.' Other corruptions are—Esub, or Eshub, or Esop, or Isaf, for 'Yúsuf;' thus 'Esubshye,' for 'Yúsuf,' Nasipore, for Nasibpúr, (from Naçıb Sháh); Nujeepore, for Najibpúr; Haleeshur (opposite Triben') for Hálíshahr, Haweli i Shahr [Sátgáon]; Mahomedshye for Mahmúdsháhí, (Jessore); Bajitpore, for Báyazídpúr (in Dínájpúr); Juffurshye, for Zafarsháhí, (not Ja'farsháhí); Kali Modunpúr (which sounds like a Hindú name), Kalim-uddinpúr; Puladassy, north of Bagurá, for Fúládsháhí; Masidpore and Majidpore, for Masjidpúr (vide Beames, Comp. Grammar, p. 209).

In the spelling of Bengal names care should be taken with the frequent ending daha, 'eddy,' as Máldahá, spelt in Persian Máldah; but the final h is radical, and the name should not be spelt Máldá, as Málwah, Rájah, &c., = Málwá, Rájá, &c.

Aurangath forbade by edict spellings like Málwah, Rájah, &c. ; he wanted people to spell Málwá, Rájá.

10. Sirkár Chátgáon (Chittagong), never properly annexed before the reign of Aurangzib. 7 mahalls; revenue, Rs. 285,607.

B. Sirkars in the Delta of the Ganges.

- 11. Sirkár Sátgáon. A small portion only, the land between the Húglí and the Saraswatí, lay west of the Húglí, whilst the bulk of the Sirkár comprised the modern district of the 24-Parganahs to the Kabadak, western Nadiyá, south-western Murshidábád, and extended in the south to Hatiágarh below Diamond Harbour. To this Sirkár belonged Mahall Kalkattá (Calcutta) which, together with two other mauza's, paid, in 1582, a land revenue of Rs. 23,905. 53 mahalls; revenue, Rs. 418,118.
- 12. Sirkár Mahmúdabád, so called after one of the three Mahmúd Sháhs of Bengal, and comprising northern Nadiyá, northern Jessore, and western Farídpúr. 88 mahalls; revenue. Rs. 290,256.
- 13. Sirkár Khalífatábád, or southern Jessore and western Báqirganj. The Sirkár is called after Khalífatábád, which was the name of the small Hawelí-parganah near Bágherhát (vide below). The largest mahall of this Sirkár was Jesar (Jessore), or Rasúlpúr; and among others, we find here the Mahalls Múndagáchha and Malikpúr, which the Khán i A'zam, when governor of Bengal under Akbar (Aín translation, p. 326), is said to have given to Bhabeshwar Rái, the ancestor of the present Rájaha of Jesar. The name of Jesar, therefore, occurs as early in 1582; hence Van den Broucke's map (1660) also gives it conspicuously as 'Jessore.'* 35 mahalls; revenue, Rs. 135,053.
- 14. Sirkár Fathábád, so called after Fath Sháh, king of Bengal, comprising a small portion of Jessore, the whole of Farídpúr, southern Báqirganj, portions of Dháká district, and the Islands of Dak'hin Shahbázpúr, Sondíp, and Sidhú, at the mouth of the Megna. The town of Farídpúr lies in the Hawelí Parganah of Fathábád. 3 mahalls, revenue, Rs. 199,239.
- 15. Sirkár Baklá,† or Ismá'ílpúr, north-east of the preceding, comprising portions of Báqirganj and Dháká districts. It is the *Bacala* of old maps. 4 mahalls; revenue, Rs. 178,736.
 - C. Sirkárs South of the Ganges and West of the Bhagirathi (Húgli).
- 16. Sirkár Audam bar, or Táṇḍah, comprising the greater portion of Murshidábád district, with portions of Bírbhúm. The name Audambar occurs also in other parts of India, e. g. in Kachh.‡ Táṇḍah did not long enjoy the position of capital: Sher Sháh already had made plans to remove it
 - * Vide, however, Westland, Jessore Report, p. 29.
- † The author of the Siyarul Mutaakhkharín calls it Hogis (ﷺ), from the Bangálí word hogis, which signifies marsh reod—a name which no doubt explains the name of Húglí; but he strangely confounds Sirkár Baklá with Sirkár Sátgáon (Húglí).
 - 1 Vide Cunningham, Ancient Geography of India, I, p. 248.

- to Ag Mahall on the opposite bank. But this was only carried out by Rájah Mán Singh, who changed the name of Ag Mahall to Ráj Mahall, and subsequently to Akbarnagar. The same Sirkár became again in later times under Prince Shujá' the seat of government, and later still under Nawáb Ja'far Murshíd Qulí Khán, who changed the name of the old town of Makhçúçábád,* the Muxabad or Muxadabad of old maps, to Murshidábád. 52 mahalls; revenue, Rs. 601,985. The Haft Iqlím gives its revenue at Rs. 597,570.
- 17. Sirkár Sharífábád, south of the preceding, comprising the remaining portions of Bírbhúm, and a large portion of Bardwán district, together with the town of Bardwán† itself. Mahalls Bárbak Singh and Fath Singh, so called after the Bengal kings Bárbak Sháh and Fath Sháh, and Sherpúr 'Atáí, where Mán Singh descated the Afgháns (Kín translation, p. 341) also belonged to this Sirkár. 26 mahalls; revenue, Rs. 562,218.
- 18. Sirkár Sulaimánábád, a straggling Sirkár, which comprised a few southern parganahs in the modern districts of Nadiyá, Bardwán, and the whole north of Húgli district. This Sirkar was so called after Sulaimán Sháh of Bengal, who also called several parganahs after himself in Murshidábád, Jessore, and Báqirganj districts; but whether the name was too long, or was purposely changed after Akbar's conquest of Bengal in honor of Prince Salím (Jahángír), it only occurs now-a-days in the form 'Salímábad.' The chief town of the Sirkár was Salímábád [Sulaimánábád], on the left bank of the Damúdar, south-east of the town of Bardwán. It is marked as 'Silimath' on Van den Broucke's map. Olá (the old name of Birnagar) in Nadiyá, known from the Srimanta legend, and Panduah, on the E. I. Railway, with its Buddhist ruins and ancient mosques, also belong to this Sirkár. 31 mahalls; revenue, Rs. 440,749.
- 19. Sirkár Madáran, extending in a semicircle from Nágor in Western Bírbhúm over Ráníganj along the Damúdar to above Bardwán, and from there over K'hand Ghosh, Jahánábad, Chandrakoná (Western Húglí District) to Mandalg'hát, at the mouth of the Rúpnáráyan River. 16 mahalls; revenue, Rs. 235,085.

Thus the above nineteen Sirkárs, which made up Bengal in 1582, paid a revenue on khalsa lands, inclusive of a few duties on salt, háts, and

- The Akbarnámah mentions a Makhçúc Khán, brother of Sa'íd Khán; vide my Kín translation, p. 388. Makhçúc Khán served in Bengal and Bihár, and his brother Sa'íd Khán was for some time governor of Bengal.
- † The Muhammadan pronunciation of the Bangáli Bordomán. The Haft Iqlím mentions an extraordinary custom that obtained in this Sirkár. "Feminae hujus provinciae instrumentum quoddam fictile penis instar in vulvam et in anum inferent, ut sordes removeant. The old kings have in vain tried to break them off this habit."

Regarding the Muhammadan antiquities of Bardwan, vide Journal, As. Bengal, for 1871, Pt. I, p. 254.

fisheries, of 253,482,106 dáms, or Rs. 6,337,052.* According to Grant, the value of the jágír lands was fixed at Rs. 4,348,892, so that we have, in 1582, A. D., as total revenue of Bengal, in its then circumscribed limits, the sum of Rs. 10,685,944. This was levied from the ryots in speciet as the equivalent of the rub, or fourth share, of the entire produce of the land, claimed by the sovereign as despotic proprietary lord of the soil.

This rent-roll remained in force during the reign of Jahángír. The remittances from Bengal to Dihlí were, it is true, not very regular, nor up to the sums levied, so much so that Jahángír appointed, in the end of his reign, Fidái Khán, governor of Bengal, merely because he promised to send regularly one million of rupees to court. Under Sháhjahán, the boundaries of Bengal were extended in the South-West, Medinípúr and Hijlí having been attached to Bengal, and in the East and North-East by conquests in Tiparah and Koch Hájo; and when Prince Shujá' was made governor, he made, shortly before 1658, a new rent-roll, which shewed 34 Sirkárs and 1350 Mahalls, and a total of revenue, on khalsa and jágír lands, of Rs. 13,115 907. Shujá's rent-roll remained in force till 1722, an addition having been made after the conquest of Chátgáon. In that year, Nawáb Ja'far Khán (Murshid Qulí Khán) issued his Kámil Jama' Tamárí, or 'Perfect Rent-roll,' in which Bengal wa sdivided into 34 Sirkárs, forming 13 Chaklahs, and sub-divided into 1660 Parganahs, with a revenue of Rs. 14,288,186.

It was, however, only after the rule of Nawab Ja'sar Khan that the Abwāb revenue‡ gradually appeared in the books. Though vast sums had been levied on this head, they had been looked upon as private emoluments of office. As early as in the tenure of Shujá' Khan, Nawab Ja'sar's successor, we find the Abwabs entered as yielding Rs. 2,172,952, and they rapidly increased under 'Alí Virdí Khan and Qasim Khan, so that, when the E. I. Company in 1765 acquired the Diwani, the net amount of all revenue collected by authority in Bengal was Rs. 25,624,223.

It is not my intention to enter here further in the historical portion of the revenue question of Bengal, nor shall 1 minutely describe the Sirkárs and the Mahalls or detail the historical and geographical

- * Grant's total is Rs. 6,344,260, or Rs. 7,208 more, chiefly on account of the higher sum given by him for Sirkár G'horág'hát. Vth Report, p. 258.
- † "The ryots (ra'iyyat) of Bengal are obedient and ready to pay taxes. During eight months of the year they pay the required sums by instalments. They personally bring the money in rupees and goldmuhurs to the appointed place. Payment in kind is not usual. Grain is always cheap. The people do not object to a survey of the lands, and the amount of the land tax is settled by the collector and the ryot (nasaq). His Majesty, from kindness, has not altered this system." Ain i Akbart.
- ‡ Imposts as fees on the renewal of annual leases of zamindárs (kháqnawini);
 nagránahs; fees for remission of imperial revenue; zar i mahaut, or imposts levied for
 the maintenance of the Nawáb's elephants; and many more.

changes that took place; these I must necessarily reserve for the second volume of my Ain translation. But I shall now attempt to trace the frontiers of Bengal under the Muhammadan rule as far as existing historical sources allow us to do.

The Frontiers of Muhammadan Bengal.

Abulfazl estimates the breadth of Bengal from Garhí to Chátgáon at four hundred kos. From north to south, the longest line was from Koch Bihár to Chittúá in Sirkár Medinípúr. "The zamíndárs are mostly Káyasths." Not a word is said on the strength of the Muhammadan population, or the progress of Islám—comparative statistics were not thought of in his age. The remark made by old English travellers that the inhabitants of the islands and the coast of south-eastern Bengal were chiefly Muhammadans, and the uncertain legend regarding the introduction, in the beginning of the 16th century, of Islamitic rites into Chátgáon by Nuçrat Sháh are the only allusions that I have seen on the subject. Neither history nor legends allude to the conversions among the semi-aboriginal rural population, that must on a large scale have taken place during the reigns of the independent kings of Bengal, chiefly, no doubt, through the exertions of the numerous Afghán Jágírdárs.

The military and naval power of the country is fixed at 23,330 horse, 4,260 guns, 1,170 elephants, and 1,400 hoats. In Nawab Ja'far's rent-roll, however, the strength of the naval establishment (nawaṛa') consisted of 768 armed cruisers and boats, which were principally stationed at Dhaka, to guard the coast against the Mags and foreign pirates; and the number of sailors included 923 Firingis, chiefly employed as gunners. The annual charges of the navy, including construction and repairs, was fixed at Rs. 813,452, which was levied under the name of 'amalah i nawaṛa' from parganahs in South-Eastern Bengal. The same rent-roll mentions that the garrisons along the whole eastern frontier from Chatgaon to Rangamaṭi on the Brahmaputra consisted of 8,112 men (ahsham), who cost 359,180, Rs. per annum.

Of the roads in Bengal we have no information prior to Van den Broucke's map (1660) in Valentyn's work. He marks (1) a principal road passing over Patna, Munger, and Rajmahall to Súti, where the Bhagirathi leaves the Ganges. From here a branch went to Moxudabath (Murshidábád), Plassi (Palási), and Hagdia,* crossed the Bhagirathi for Gasiapore,

[•] Hagdia is Agardíp. Van den Broucko's map gives here an interesting particular. He marks Hagdia on the left bank of the river, and Gasiapoor (Gházípúr) on the right bank. Both places lie now far from the right bank, with only a small k'hář between them, and a large semi-circular lake round both. The lake, as else-

and passed on to Bardwan, Medinipur, Bhadrak (wrongly marked on the right bank of the Baitarani), and Katak. The other branch went from Sútí along the right bank of the Podda to Fathábád, from where it passed on to Dháká. These two branches are marked as principal roads (sháhí rastah). (2) A road from Bardwan to Baccaresoor (Baklesar in Birbhum, famous for its hot springs, within the Marátha Intrenchment of Nágor), and from there to Qásimbázár and the banks of the Ganges, and across the river to 'Hasiaarhati.' This is Hajrahattí, on the left bank of the Podda. now also a ferry place, near the entrance of the Burul River, below Rámpúr Boáliá. and seems to be the Qázíhattí (Beng. Kajierhattí), which Abulfazl mentions in the Ain. From Hasiaarhati the road passed to a place called Harwa, and from there to Ceerpoor Mirts, i. e. Sherpur Murchah, on the Karataya, and passing over Tessiadin (Chandiján, north of Sherpúr, ?) to Gorregaut (G'horág'hát) and Bareithela (Bantalá) on the Brahmaputra, which will be mentioned below as a frontier town. (3) A road from Bardwán over Salımábad, Hugh, Jessore, Bosnah, Fathábád, across the river to Sjatterapoer,* Casisella, and Idrákpúr, opposite the confluence of the Lak'hiá and the Dalásari, near Ballál Sen's palace. (4) A road from Dháka, across the Dalásari to Piaarpoer and Bedlia. which latter place is marked at the point where the Dalasari leaves the Jamuná, and from there to Sasiadpoor (Shahzadpur, in Pabnah), and Handiael (Harial).

The Western Frontier.

In the north-west, the frontier of Bengal extended but little beyond the Kosí River; but under some of the early Muhammadan governors and the independent kings, the Bengal empire included all upper Bihar north of the Ganges as far as Sáran. Of Ilyás Shah, for example, it is asserted that he was the founder of Hájípúr, opposite Patna, on the Ghandak, although Frúz Sháh, on his return from Bengal, appointed for the first time Imperial collectors in Tirhut. Sikandar Shah's coins, again, have been found far west of the Kúsí.

Southern Bihár only belonged to Bengal from the time of the conquest by Bakhtyár Khiljí to about 730 A. H. (A. D. 1330), when Muhammad Tughluq annexed it to Dihlí. From 800 again (A. D. 1397), the whole of Bihár belonged to the kingdom of Jaunpúr. Under Buhlúl again, Daryá Khán Lohání was governor of Bihár; and under Ibráhím, Daryá's son Bahádur Khán assumed independence in Bihár under the title of Sháh Muham-

where in Bengal, is the old bed of the river, which now follows the shorter route along the chord of the loop. This change, therefore, took place after 1660.

Thus also Nadiyá lies now on the right bank of the river; but west of the town, there is still the old channel, which goes by the name of Ganga Bhárat.

^{*} Rennel gives Satrapur; but modern maps give no such name.

mad.* It is not clear how far these Afghán chiefs depended on Husain Sháh of Bengal, whom inscriptions represent firmly established in 903 at Munger, while other inscriptions from Bonhárá and Cheran (near Sáran) would lead us to conclude that the whole of Upper Bihár and the western portions of Southern Bihár belonged to him in A. H. 908 and 909 (A. D. 1502, 1503). On the other hand, we hear in history of the cession by Husain Sháh of Bihar, Sáran, and Tirhut, and of the reconquest of these lands by Nuçrat Sháh, who, if he could not hold them, assisted the Afgháns against Bábar. Nuçrat Sháh scems even to have passed beyond the Ghandak; for a mosque near Sikandarpúr, on the right bank of the river, in District A'zamgarh, was built during his reign.

South of the Ganges, the western frontier is better defined. Fort Taliágarh, or Garhí,† near K'halgáon (Colgong) on the Ganges, was looked upon as the entrance, or key, to Bengal—a position which Muhammadan historians compare with that of Fort Sahwán on the Indus, the key of Sindh. From Garhí the frontier passed along the Ganges to the south of Ag-Mahall (Ráj Mahall), when it again turned westward to north-western Bírbhúm, passing along the boundary of the modern Santál Parganahs to the confluence of the Barákar and the Damúdar, from where it went along the left bank of the Damúdar to the neighbourhood of the town of Bardwán. From here the frontier took again a westerly direction, and passed along the north-western and western boundaries of the modern Húglí and Habrah (Howrah) Districts down to Mandalg'hát, where the Rúpnáráyan flows into the Húglí River.

This boundary, it will be seen, excludes the whole of the Santál Parganahs from the south of K'halgáon to the Barákar, Pachet,‡ and the territory of the Rájahs of Bishnpúr (Bankurá). In vain do we look in Santalia for Muhammadan names of villages and towns; and though there can be no doubt that the Muhammadan kings of Bengal tried to fiold parts of the hills by establishing thánahs and appointing jágírholders, no permanent settlements were formed. One of the most westerly thánahs in southern Santalia was Sarhat, N. W. of Shiúrí (Soory) in Bírbhúm, which is mentioned in Tribení inscriptions; whilst the settlement of Pathán

- Called in many MSS. Mahmúd.
- † It is not known which king built the fort, but it may be accidental that the name does not occur in the Tabaqát i Náçirí and in Baraní. At K'halgáon, Mahmúd Sháh III., the last independent king of Bengal, died in 945 (1538 A. D.).
- ‡ Regarding the invasion of Chutiá Nágpúr by the Muhammadans, vide J. A. S. B, 1871, Part I, p. 111.
- § Sarhat, spelt on inscriptions Sirhat, lies on the left bank of the Ajai River. Its name on modern maps is corrupted to Saruth. Rennell has Sarhant. Outside the place, the survey maps mark two old forts. A little to the south of it, a village of the name of Lukrakhonda is marked. Bennell on his map of Birbham (Bengal Atlas,

jágírdárs, before and after the time of Sher Sháh, as a standing militia against the inroads of the tribes of Jhárk'hand (Chutiá Nágpúr), led to the formation of the great Muhammadan zamíndárí of Bírbhúm, which gave the E. I. Company some trouble.

In Todar Mall's rent-roll the following Mahalls are mentioned along this portion of the western frontier of Bengal—Ag Mahall (Rájmahall), Kánkjol, Kunwar Partáb, Molesar,* in Sirkár Audambar or Tándah; Bharkúndah, Akbarsháhí, Katangah, in Sharifábád (Bírbhúm); Nágor, Sainbhúm, Shergarh (Rúníganj), Champánagarí (N. W. of the town of Bardwán), Madáran (Jahánábád and Chandrakoná, west of Húglí), Chittúá (District Medinípúr), and Mandalg'hát, at the mouth of the Rúpnáráyan, all belonging to Sirkár Madáran.

The name of the frontier mahall of Bhark undah in Birbhum, mentioned above, seems to have been formerly extended to the whole of Birbhum and the Santál Parganahs. In this extended sense, it is used in the Táríkh i Dáúdí, ton De Barros' map of Bengal, and on Blaev's map of India (vide Pl. IV). In the latter, it is only given as 'Barcunda,' but in the former as 'Reino de Barcunda,' extending from Ferrandus (a corruption of Bardwan) to Gorij, in which we recognize Garhi, the 'key of Bengal.' West of Barcunda, De Blaev and De Barros give 'Patanes,' i. e. the Pathans. the military and semi-independent landholders of the western Bengal frontier. On the Ganges, both maps shew Gouro (Gaur), and opposite to it. ' Para', for which De Barros gives 'Rara.' Both spellings may be mistakes for Tara, i e. Tandah, which should of course be on the other side of the river; or 'Rara' stands for the old Hindú division of Rádha, which there commences. South of 'Ferrandus,' the old maps give 'Mandaram' and 'Cospetir,' which latter name is wroughy placed on Blaev's map north of Mandaram, whilst De Barros has it correctly west of it. In Mandaram we recognize Madáran, the chief town of Sirkár Madáran, a name which even now-a-days is pronounced by the peasants Mandáran.§ 'Cospetir,' or De

No. II.) places a 'Lacaracuond,' in conspicuous letters, south of Nágor; but modern maps give no such locality. Could this be the Lak'hnúr of the Tabaqat?

^{*} Sabiq (i. e. former) Molesar and Darín Molesar. The former name is wrong spelt in the Indian Atlas (Sheet 113) Sarik Molissor.

[†] Dowson, Elliot's History of India, IV., pp. 360, 364.

[‡] South of Para or Rara, Blacv and De Barros give a place of the name of Moulauadangur; and below Gouro, Patana or Patona, and Meneitipur, which I have not identified.

[§] I have identified Madáran with Bhítargarh in Jahánábád, in the north-western corner of Húgli District. Vide Proceedings, As. Socy. Bengal, for April, 1870, where the legends of the place are given.

As the name of Jahánábád occurs in the Akbarnámah, it has no connexion with Sháhjahán's name, but rofers more likely to one of the numerous Khán Jahána of the Pathán rule.

Barros' 'Reino Cospetir,' a name that puzzled me long, is clearly 'the kingdom of the Gajpatí,' or Lord of elephants, the title of the kings of Orisá, the final r being nothing but the ending of the Bangálí genitive. Sirkár Madáran was indeed the frontier of Orisá; but if the legends of the Húglí District speak of the Gajpatís having once extended their kingdom to the Ganges (Húglí River), it must have been prior to the time when Sátgáon became the seat of Muhammadan governors.

It is remarkable that among the names of the jungly and hilly frontier districts, we find so many ending in bhúm. Thus we have Bírbhúm;* Sainbhúm, along the left bank of the Ajai, in Bírbhúm district; Sik'harbhúm or Shergarh, the mahall to which Ráníganj belongs; Gopíbhúm, along the right bank of the Ajai; Bámanbhúm or Bráhmanbhúm, in northern Medinípúr District; Mánbhúm, Baráhbhúm, Dhalbhúm, Singbhúm, in Chutiá Nágpúr; Túnbhúm, in southern Parúliá; Malbhúm, the frontier of Bardwán and Medinípúr Districts; Bhanjibhúm, with the town of Medinípúr,† &c. Similarly, the frontier district between Rangpúr and the Brahmaputra, comprising Mahalls Bhítarband and Bahirband, is called in Shujá's rent-roll 'Bangálbhúm.'

I mentioned Mahall Mandalg'hát at the confluence of the Rúpnáráyan and the Húglí as the south-western frontier of Bengal. The Districts of Medinípúr and Hijlí (south-east of Medinípúr) were therefore excluded. They belonged to the kingdom of Orisá till A. H. 975, or A. D. 1567,† when Sulaimán, king of Bengal, and his general Kálá Pahár defeated Mukund Deb, the last Gajpatí. Even after the Afghán conquest, Medinípúr and Hijli continued to belong to the province of Orisa, when Khan Jahan Afghán was appointed by Dáúd Sháh governor of Orísá, Qutlú Khán Lohání being made governor of Púrí. On the 20th Zí Qa'dah, 982, (3rd March, 1575) Mun'im KhánKhánán, Akbar's general, defeated Dáúd Shah at Tukaroi or Mughulmari, north of Jalesar, and in the peace of Katak, in the beginning of 983, Bihár and Bengal were ceded. In 984. Dáúd again invaded Lower Bengal, but was defeated and killed on the 15th Rabí' II, 984, near Ag Mahall by Husain Quli Khán Jahán, when Bengal was again annexed to Dihli, and the Afghans withdrew to Orísá. Then the Bengal Military Revolt broke out, and Orísá was invaded. in A. H. 1000, (A. D. 1592) by Mán Singh, when the country was finally annexed to the Dihli empire. Hence Medinipur and Hijli appear

^{*} The name occurs in the Kin as a Mahall; but as name for a large division it does not seem to have been used before the 18th century.

[†] The Kin also mentions a mahall Bhowalbhum under Sirkar Madaran; modern maps do not give this name.

[‡] So according to the Akbarnámah. Stirling fixes an earlier date; but Sulaimán reigned from A. H. 975 to 980. Besides, Akbar sent in 972-978 ambassadors to Mukand Deb.

together in Todar Mall's rent-roll as one of the 5 Sirkárs of the province of Orisá. Subsequently, Orisá had separate governors; but under Prince Shujá' their power was lessened, and the portion from Mandalg'hát to Baleswar (Balasore) was separated from Orisá and permanently attached to Bengal.*

Hijli (Hidgelee, Hedjelee, Grant; Hingeli, Van den Broucke; Ingellee, Rennell; Injelee, Stewart, Marshman; Angeli, Purchas, De Laët, &c.) appears in the Kin under the name of Maljhatta. According to the legends preserved in the District, the Muhammadans first attempted a settlement during the reign of Husain Shah of Bengal, about A. D. 1505, when one Táj Khán Masnad i 'Alí and his brother Sikandar Pahlawán established themselves at the mouth of the Rasúlpúr River,† opposite Sagar Island. They conquered the whole of Hijli, which is said to have remained in the family for nearly eighty years, when it passed into the possession of a Hindú. As late as 1630 we hear of the conquest of Hijli. " Hingeli, which had for many years a chief of its own, was conquered about 1630 by the Great Mogul; but in 1660, the lawful chief of Hingeli, who from a child had been kept a prisoner, found means to escape, and with the help of his own to re-conquer his country. But he did not long enjoy it: he was in 1661 brought into Aurangzeb's power with the help of the E. I. Company [the Dutch Company], and was again imprisoned and better looked after than at first."1

The Southern Frontier.

The southern frontier of Muhammadan Bengal was the northern outskirt of the Sundarban, which extended, generally speaking, in the same manner almost as it now does, from Hatiágarh, south of Diamond Harbour on the Húgli,

• "Sjah Sousa had already during his time divided Hingeli from Orisa, and had put there a separate governor, and it is for this reason alone that Hingeli, which by position belongs to Orisa, has been attached to Bengal. So it is also with the governors of Ballasour and Pipeli [Piplior Sháhbandar, now deserted, on the Subarnarekhá River], which the Great Mogul ordered once to be under the governor of Orisa and then again under the governor of Bengal, because the two places are close to the sea." F. Valentyn, Vol V.

Van den Broncke's map of Bengal in 1660, given by Valentyn, still shews north-west of the town of Medinipur the "Gedenkteeken," or memorial stone, (corresponding to the 'Old Towor' of modern maps) that marked the frontier between Bengal and Orisa. Grant says that the coast of Hijli and Medinipur as far as Balhsore (Baleswar) was attached to Bengal on account of the Mags and the Portuguese privateers, who were to some extent controlled by the Imperial fleet stationed at Dhaka.

- † Few rivers in India have Muhammadan names. Due south of Contai the maps give a village of the name of Masnad 'Klípúr. Táj Khán's tomb is on the Rasúlpúr River.
 - ‡ From Valentyn's work, Vol. V. The 'Alamgirnamah says nothing about it.

to Bágherhát in southern Jessore and to the Haring'hátá (Horingotta), or 'Deer-shore River;' i. e. along the southern mahalls of Sirkárs Sátgáon and Khalífatábád. Beyond the Haring'hátá and its northern portion, called the Madhúmatí or 'honey-flowing,' the frontier comprised Sirkárs Baklá and Fathábád, the modern districts of Farídpúr and Baqirganj (north). Sirkár Fathábád included the islands of Dak'hin Shahbázpúr and Sondíp, at the mouth of the Megna. Tiparah, Bhaluah, Noak'hálí, and District Chátgáon, were contested ground, of which the Rájahs of Tiparah and Arakan were, at least before the 17th century, oftener masters than the Muhammadans. It was only after the transfer of the capital from Rájmahall to Dháká. that the south-east frontier of Bengal was extended to the Phaní River, which was the imperial frontier till the beginning of Aurangzíb's reign, when Chátgáon was permanently conquered, assessed, and annexed to 'Çúbah Bangálah.'

Various etymologies have been proposed in explanation of the word 'Sundarban.' It has been derived from sundar and ban,' the beautiful forest;' or from sundari, a small timber tree (Heretiera litoralis), which is exported as fuel in vast quantities from the coast and is supposed to have been so called from its red wood. Others again have derived the word from Chandradip-ban, or Chandradip forest, from the large zamindari of Chandradip, which occupies the south and south-east of Báqirganj District. Or, the name has been connected with the Chandabhandas,* an old Sundarban tribe. Grant derives it from Chandraband, 'the embankment of the moon,' which seems to have been the etymology that obtained at his time, and which has led to the spelling 'Soonderbund' adopted by Europeans.

The application of the name to the whole seacoast of southern Bengal is modern. Muhammadan historians call the coast strip from the Húglí to the Megna 'Bhátí,' or 'low land subject to the influx of the tide,' and even now-a-days this name is very generally used. The sovereignty of this district, according to the Akbarnámah and the Rájah Pratápaditya legend, was divided among twelve chiefs; and Col. Wilford, whatever may have been the source of his information, says that "the kings of Arakan and Comillá were constantly striving for the mastery, and assumed the title of lords of the twelve Bhúniyás."

The sea coast itself is marked on Van den Broucke's map in Valentyn's work as 'onbekent,' or 'unknown,' consisting of numerous islands and

[•] A copper plate grant in the possession of the Society, found at 'Adilpur (Edilpore), mentions that the villages of Baguli, Bittogadá, and Udayamuna, were given, in the third year of the reign of Keahab Sen, i. s. in 1136 A. D., to one Jovaradeb Sarma. The grant mentions the tribe of the Chandabhandas. The reading Chandabhanda, as Bábu Pratapachandra Ghosh informs me, is an improved reading for Chattabhatta, as the name was read by Gobind Ram; vide Journal, 1838, Vol. VII, p. 40.

[†] As. Researches, XIV, p. 451.

rivers, 'peryculeous' for ships, being the place where the "Jagt ter Shelling" foundered in 1661.

In order to trace the direction of the northern outskirt of the Sundarban, as it existed some time before 1582 A. D., we have again recourse to Todar Mall's rent-roll in the Ain. There we find that Mahall Hatisgarh (below Diamond Harbour) was, in 1582, the most southerly assessed mahall of Sirkár Sátgáon. The jungle boundary then passed north-east to Baridhatti and Medinimall, north-west of Port Canning, to Bálindá and Máhíhattí (Mychattee), then south again to Dhuliápúr,† and Bhaluká to the Kabadak River. These mahalls belong to what is now called the 24-Parganahs; and Sheet 121 of the Indian Atlas of the Survey Department will shew that they lie even now-a-days very little north of the present northern limit of the Sunderban in the 24-Parganahs. Going up the Kabadak, in Jessore, we come to Amadi, t to the north of which, in the immediate neighbourhood, we have Masidkoor, a corruption of Masjidkur, one of the clearances of Khán Jahán (died A. D. 1459),§ the warrior saint of Khalifatábad or Southern Jessore, to whom the traditions of the present day point as an indefatigable establisher of Sundarban-ábádís (clearances.) The A'in then gives Mahall Tala, with Tala on the left bank of the Kabadak as chief town and Kopilmuni near it, and then mahalls Sáhas, Khálicpúr, Charúliá, Rangdiyá (wrongly called in the Indian Atlas Sangdia) and Salimábád, north of the modern Morrellganj at the beginning of the Haring'hátá. North-west of Morrellganj, on the Bhairab (the 'dreadful'). we have the small station of Bagherhat, which gives name to a Sub-Division, and in its immediate neighbourhood we come to another clearance by the patron-saint of Jessore, where his mosque and tomb stand. It is the country round about Bagherhat which up to the end of last century bore the name given it in the Ain, 'Haweli Khalifatabad,' the 'Vicegerent's clearance.' Here, amidst the creeks and the jungles, which no horseman can approach, Nucrat Shah, as will be seen below, erected a mint, apparently in opposition to his father 'Alauddin Husain Shah.**

- * Vide Mr. Foster's article, Journal, As. Socy. Bengal, 1872, Part I, p. 36.
- † North of Ishwaripur (Issuripore), the residence of Pratapaditya.
- 1 Marked wrongly on the Survey map Armadi. Rennell has correctly Amadi.
- § Westland, Jessore Report, p. 20; Gaur Dás Baisákh, Journal, As. Soc. Bengal, 1867, pp. 130, 131; also, Journal, 1872, Part I, p 108
- || Rash Bihari Bose, J. A. S. Bengal, 1870, Part I, p. 235; Westland, Jessore Report. Chapt VI, and p. 286.
 - There also the Kin has the form Sulaiminabad.
- It is curious that a little higher up on the Bhairab, east of Khulní, where the Athárabanka (the 'eighteen windings') joins the Bhairab, there is an 'Aláipár, á. c. 'Aláuddín's town. Were it not for the distinct statement of the Riydsussuldin that 'Aláuddín, after arriving as an adventurer in Bengal, settled at a Chandpur (a very

Thus we see that in southern Jessore also the northern limit of the Sundarban has not considerably changed since 1450 A. D.

Passing from the Haring'hátá eastward, we come to Sirkárs Baklá and Fathábád. Sirkár Baklá only contained four mahalls, viz. Ismá'ílpúr or Baklá; Srírámpúr; Sháhzádpúr; and 'Adilpúr, (from 'adil' just,' corrupted on the maps to Edilpore), which all belong to Baqirganj District. Abulfazl, in speaking of the great cyclone that swept in 1583 over Baklá, says that the then zamindár of Baklá had a son of the name of Pramánand Rái. Sirkár Fathábád derives its name from the Haweli mahall Fathábád, in which the modern station of Faridpur lies. Yusufpur and Belphuli, in Jessore District; Hawelí Fathábád and Sirdiá (Sherdia), in Farídpúr; Balaur, Telhattí, Sarail or Jalálpúr,* Khargapúr, in both Farídpúr and Dháká; Hazratpúr, in Dháká; Rasúlpúr, in Dháká and Báqirganj; the Islands of Sondip and Shahbazpur; and a few other mahalls which I have not vet identified, belong to this Sirkar. Thus we see that the greater portion of both Sirkars lies between the Haring'hata (Madhúmatí) and the Tituliá River, which flows between Báqirganj District and the island of Dak'hin Shahbazpur. At the mouth of the Titulia we find the Don Manik Islands, one of the few still surviving geographical names of the Portuguese.† Opposite to these islands we have mahall Názirpúr, which we find on the maps of De Barros and Blaev, placed rather far to the north. Near it, we also have 'Fatiabas'. I the chief town of Sirkar Fathabad. The whole south and south-east of Baqirganj District is occupied by the old Chandradip zamindari, which according to some, as we saw above, gives name to the Sundarban. On Rennell's map it is marked 'depopulated by the Mugs.'

Abulfazl says that there were in Sirkár Fathábád three classes of zamíndárs, which perhaps refers to the independent Afghán, Hindú, and Portuguese chiefs. When Akbar's army, in 1574, under Mun'im Khán-Khánán invaded Bengal and Orísá, Murád Khán, one of the officers, was despatched to South-Eastern Bengal. He conquered, says the

common name) in Rádha District, i. e. west of the Húglí, I would be inclined to identify the Chandpur near this 'Alaipur as the place where the Husain dynasty of Bengal kings had its home, especially because Husain first obtained power in the adjacent district of Faridpur (Fathábád), where his earliest coins are struck.

The Indian atlas (sheet No. 121) spells 'Aláipúr 'Alypore,' which blots out every historical recollection, and places it moreover wrongly on the right bank, instead of on the left, of the Athárabanká. 'Aláipúr is a flourishing place and has numerous potteries.

- Which, like the name of the Sirkar, reminds us of Jaldludden Path Shah.
- † Their names for Húgli (Porto Piqueno) and for Chátgáon (Porto Grande) are no longer known; but Sherpúr Firingi, Firingibásár, Point Palmyras, still remind us of their former importance in this part of India.
 - 1 Van den Broucke's map has wrongly Fathpur.

Akbarnámah, Sirkárs Baklá and Fathábád, and settled there; but after some time, he came into collision with Mukund, the powerful Hindú zamindár of Fathábád and Bosnah, who, in order to get rid of him. invited him to a feast and murdered him together with his sons.* This notice helps us to explain a remark made by Grant that in Shah Shuia's rent-roll (1658) a portion of Sundarban land had for the first time been assessed at Rs. 8,454, the ábádís being called Murádkhánah.† The name of Mukund still lives in the name of the large island 'Char Mukundia' in the Ganges opposite Faridpur. This Mukund is the same zamindar whom the Pádisháhnámah wrongly calls 'Mukindra of Bosnah.' His son Satrjít gave Jahángír's governors of Bengal no end of trouble, and refused to send in the customary peskkash or do homage at the court of Dháká. He was in secret understanding with the Rájahs of Koch Bihár and Koch Hájo, and was at last, in the reign of Shahjahan, captured and executed at Dháká (about 1636, A. D.) One of his descendants, or successors in the zamíndárí, is the notorious Sítárám Rái of Mahmúdpúr. I

Another Zamíndár of Fathábád is mentioned in the beginning of Sháhjahán's reign, Majlis Báyazíd,—by his very name an Afghán.

The Parganahs to the south of Báqirganj are called on the maps 'Boozoorgoomedpore' and 'Arungpore,' which names are connected with Buzurg Umed Khán, son of Sháistah Khán (Aurangzíb's governor of Bengal from 1664 to 1677) and with Aurangzíb, 'Arang' being a corruption of Aurang. East of these two Parganahs we have Sháistahnagar. § These names, though they do not perhaps shew when the mahalis were reclaimed, point to the time when they came for the first time on the Imperial rent-roll.

Sirkár Fathábád, as stated above, comprised the islands of Dak'hin-Shahbázpúr, Sondíp, &c. Of the latter island we have a short notice by Cæsar Frederick, the Venetian merchant, who travelled in Asia, as he himself says, from 1563 to 1581. He left Pegú for Chatigan (Chátgáon), "between

Kin translation, p. 874.

[†] Grant derives the name from murád and khánah, the 'house of desire;' but there is little doubt that we should derive it from Murád Khán, 'Murád Khán's clearance.' I do not know to what part of Ráqirganj or Farídpúr the name was applied. Grant also says that Murád Khánah was sometimes called Jerádkhanah.

[‡] Journal, As. Sooy. Bengal, for 1872, Part I, pp. 58, 59. Satrjít's name occurs in the name of the town of Satrjítpúr on the Noboganga, in north-eastern Jessore, not far from Mahmúdpúr (wrongly called Mahomedpore on all modern maps) on the Madhúmatí and from the old town of Bosnah, on the Alangk'hálí [Ellenkalli] Branch. Vide Westland's Jessore Report, p. 32.

[§] Sháistah Khán's real name is Mírsá Abú Tálib; hence we find in Dháká District a Tálibábád. Núr Jahán was Sháistah Khán's aunt; vide Kín translition, p. 512.

which two places there was much commerce in silver," but "encountered a 'Touffon' (túfán, cyclone), which take place in the East Indies every ten or twelve years; they are such tempests and stormes, that it is a thing incredible but to those that have seen it," and was driven to Sondip. "And when the people of the Island saw the ship, and that we were comming aland: presently they made a place of bazar, or a market, with shops right over against the ship, with all manner of provision to eate, which they brought down in great abundance, and sold it so good cheape, that we were amazed at the cheapness thereof. I bought many salted kine there for the provision of the ship for half a Larine apiece, which Larine + may be 12 shillings 6 pence, being very good and fat; and 4 wilde hogges ready dressed for a . Larine : great fat hennes for a Bizze [pice] a piece, which is at the most a penny : and the people told us that we were deceived the half of our money, because we bought things so deare. Also a sack of rice for a thing of nothing; and consequently all other things for humaine sustenance were there in such abundance, that it is a thing incredible but to them that have seen it. Island is called Sondiva, belonging to the kingdome of Bengala, distant 120 miles from Chatigan, to which place we were bound. The people are Moores, and the king a very good man of a Moore king, for if he had been a tyrant as others be, he might have robbed us of all."

Ralph Fitch also was about the same time in south-eastern Bengal. He says," From Chatigan in Bengala I came to B a c o l a [Sirkár Baklá]; the king whereof is a Gentile [Hindú], a man very well disposed and delighted much to shoot in a gun. His country is very great and fruitful, and hath store of rice, much cotton cloth, and cloth of silke. The houses be very faire and high builded, the streetes large, the people naked except a little cloth about their waste. The women wear great store of silver hoopes about their neckes and armes, and their legs are ringed with silver and copper, and rings made of elephants teeth.

"From Bacola I went to Serrepore, which standeth upon the river Ganges, the king is called Choudery. They be all here abouts rebels against their king Zebaldim Echebar: § for here are so many rivers and islands,

The export of silver from Pegú to Bengal may have supplied the Bengal mints with silver. Sir A. Phayre and Dr. T. Oldham speak of the export of gold from Burma to the Coromandel coast. Considerable quantities of silver may also have come from Asam, where silverpieces even for small fractions of a rupes were current.

[†] Lári (لارى). Kin translation, pp. 23, 37. It is so called from Láristán in Persia.

[‡] Sherpur Firingi, marked by Van den Broucke a little south of Idrákpur, on the Dalásari, in Parganah Bikrampur, where Rájá Ballál Sen's residence was. It is not given on modern maps.

The first b is a constant misprint for l. Jaláluddín Akbar.

that they flee from one to another, whereby his horsemen cannot prevail against them. Great store of cotton cloth is made here.

"Sinnergan [Sunnárgáon] is a towne six leagues from Serrepore, where there is the best and finest cloth made of cotton that is in all India. The chief king of all these countries is called Isacan,* and he is chiefe of all the other kings, and is a great friend to all Christians. *** I went from Serrepore the 28th November 1582 for Pegu."

Sondíp was only conquered in the end of 1666 (middle of Jumáda II., 1076), when Diláwar Khán Zamíndár submitted, though not without fighting, to Aurangzíb's army that invaded Chátgáop.

I have a few words to say on the hypothesis which has often been started, that the whole of the Sundarban was once in a flourishing condition. No convincing prooft has hitherto been adduced; and I believe, on physical grounds, that the supposition is impossible. The sporadic remains of tanks, gháts, and short roads, point to mere attempts at colonization. The old Portuguese and Dutch maps have also been frequently mentioned as affording testimony that the Sundarban, even up to the 16th century, was well cultivated; and the difficulty of identifying the mysterious names of the five Sundarban towns Pacaculi, Cuipitavaz, Noldy, Dipuria (or Dapara), and Tiparia, which are placed on the maps of De Barros, Blaev, and. Van den Broucke close to the coast-line, has inclined people to believe that they represent "lost towns." Now the first of these five towns, from its position, belongs to the Sundarban of the 24-Parganahs, and the second (Cuipitavaz) to that of Jessore District, whilst the remaining three lie east of it. But Pacaculi is either, as Col. Gastrell once suggested to me, a mistake for Pacacuti, i. e. pakká koťhí, i a factory or warehouse, erected by some trading company, as we find several along the Húgli; or it stands for Penchakuli, the name of the tract opposite the present month of the Damúdar, or a little above the northern limit of the Sundarban. Cuipitavaz I have no hesitation to identify with Khalifatábád. § Van den Broucke also places it correctly south-east of Jessore. Noldy is the town and mahall of Noldi (Naldi) on the Noboganga, east of Jessore, near the Madhumati. Dipuria is Dapara, or Daspara, south-east of Baqirganj station, near the right bank of the Titulia, still prominently marked on Rennell's map; and Tiparia cannot stand for anything else but the district of Tiparah, which is correctly placed north-east of Daspara.

^{&#}x27;Isá Khán. Abul Fazi calls him 'king of Bhát,' and says that twelve samindárs were under him. He was powerful enough to make war with Koch Bihár. Vide Kin translation, p. 342, note.

[†] Westland, Jessore Report, p. 231.

¹ Houses are either karhchá [mud-houses], or pakká, brick or stone-built.

 $[\]S$ The letter f often turns in Bangálí to p; hence Khalifatábád becomes Rolipitábád. Thus Firáspár becomes Perojepore.

The old Portuguese and Dutch maps, therefore, prove nothing. They support the conclusion which I drew from Todar Mall's rent-roll, that in the 24-Parganahs and Jessore the northern limit of the Sundarban, omitting recent clearances, was in the fifteenth century much the same as it is now. But considerable progress must have been made in Báqirganj District, as we see from the numerous accessions, during that period, to the Imperial rent-roll.

Of other names given on old maps along the southern boundary of Bengal, we have (above Noldy) Nao Muluco (?), Buram (Borhun, in the 24-Parganahs); Maluco (Bhaluká, cn the Kabadak,?); west of them, Agrapara and Xore, (Agrapárá and Dak'hineshor, north of Calcutta); and on the other side of the Húglí, Abegaca, which seems to be some Amgáchha, unless it is slightly misplaced and refers to Ambiká (Kalnah); Bernagar, which should be Barnagar, on the other side of the river below Xore; Betor(?) as on Blaev's map, and Belor, (?) on that of De Barros. Van den Brouke's map gives, in Húglí District, Sjanabath (Jahánábád); Sjandercona (Chandrakoná); Cannacoel (Kánákul); Deniachali (Dhonek'hálí); Caatgam (Sátgáon); Tripeni (Tripaní, the Muhammadan form of Tribení); Pandua (Panduah); Sjanegger; Basanderi (the old mahall Basandhari), where Van den Broucke makes the remark,' t Bosh Sanderie alwaar Alexandre M. gestuyt werd, 'the bush Sanderie where Alexander the Great was stopped!'

Again, along the lower Ganges the old maps have Bicaram (Bikrampúr, south of Dháká); Belhaldy; Angara (Angaria, at the confluence of the Kirtinázá and the Megna); Sornagam (Sunnárgáon); Dacca; Mularangue;* Bunder (Bandar, 'harbour'); Nazirpur, mentioned above; Bulnei or Bulnee,?; Guacala or Gucala, perhaps a mistake for Bacala; Noorkuly or Noricoel, as Van den Broucke gives.it, (Noríkol, due south of Dháká, and a little south of the right bank of the Kirtinásá); Sundīva (Sondíp Island); Jugadia (Jogdiah in Noák'hálí near the Little Phaní, mentioned in the 'Alamgírnámah as an Imperial thánah, and often quoted as the seat of English and French factories in the eighteenth century); Traquetea,?; Maua, or Moua, and Alvia, for which Van den Broucke gives Mava and Alvia,?; Jefferi, on Van den Broucke's map, the same as Rennell's Jeffri, at the mouth of the Phaní, right bank.

The coast of Arakan on the maps of De Barros and Blaev is broken up into numerous islands as the Sundarban coast: it looks as if some of them belonged to Bengal. Thus we find Bulua and Bacala, which must refer to Bhaluah in south Tiparah and Baklá. Chokuria may be identified with Chukuria, marked on modern maps opposite Maskal Island, on the Marrori

As this place is marked on an island south-west of Dháká, it seems to be Múlnadángi in the south of Char Mukundiá.

River, as than and saltgolah; but the names Irabu, Maoa (perhaps a mere repetition of the Maua given above), Santatoly, Orieton, are unknown to me.

Blaev's map (Pl. IV) and the Chart of the empire of the Grand Mogul by N. Sausson (A. D. 1652) give opposite Chatigam (Chittagong) a town, called Bengala or Bengola. Purchas (a compiler who never came to India) says in his 'Pilgrims,' "Gouro, the seat Royall, and Bengala are faire Cities. Of this, the Gulfe, sometimes called Gangeticus, now beareth name Golfo di Bengala." Rennell, in his 'Memoir,' mentions the town as being given "in some ancient maps and books of travels; but no traces of such a place exist." But he says that it is placed near the eastern branch of the Ganges, and that it may have been carried away by the river (Ganges?). Lately also, a writer in Mookerjea's Journal (Dec. 1872), Mr. H. J. Rainey, published an imaginative account of the submersion of this now lost city, which in his opinion had given name to the kingdom of Bengal. But the town is nowhere mentioned by Muhammadan historians, nor by Ibn Batútah, Cæsar Frederick, and Ralph Fitch who were in Chatgaon, nor by De Barros and Van den Broucke. The probability, therefore, is that no such town ever existed, and that the name was put on Blaev's map from Purchas's statement; or else the name 'Bengola' is a mere corruption of what we call a 'Bungalow' (سكلة, bangalah), or a 'Flagstaff Bungalow,' of which we find several marked on District maps of Chittagong along the Karanphúlí River, as early as on Rennell's chart However, this mysterious town is not to be identified with the place 'Dianga' given by Van den Broucke half way between Chittagong and Rammoe (Rámú, or Rambú*), because Dianga is the Dak'hindángá or the Brahmandángá, both on the Sangú River, south of Chátgáon, where saltgolahs still exist. +

Regarding the State of Codavascam, which the old maps place east and north-east of Chátgaon, vide Wilford's Essay, As. Researches, Vol. XIV, p. 450.

The province of Chátgáon was no secure possession, and seems to have been alternately in the hands of the kings of Bengal, the Rájahs of Tiparah, and the kings of Arakan. In 750 A. H. (A. D. 1350), about which year Ibn Batútah was in Chátgáon,‡ it belonged to king Fakhruddín of Sunnárgáon. That year falls within the reign of the Arakanese king Meng-di, who is said to have reigned from A. D. 1279 to 1385, or 106 years,§ when the king of Thu-ra-tan (Bengal), called Nga-pu-kheng, courted

- The most south-easterly point to which the Mughuls advanced.
- † The word 'danga,' which occurs so often in geographical names in Bengal, signifies 'high land'.
 - ‡ Called in Lee's translation مدكوان. Regarding Fakhruddin vide below.
- § Vide Sir A. P. Phayro's History of Arakan, Journal, A. S. Bengal, for 1844, p. 45. Thu-ra-tan Sir Arthur Phayre identifies with Sunnargaon.

his alliance. About 1407, again, the king Meng-tsau-mwun fled to Bengal, and witnessed the war between Rájah Káns and Jaunpúr. He was ultimately restored to his throne with the help of Bengal troops; but he became "tributary to the king of Thu-ra-tan, and from this time the coins of the Arakan kings bore on the reverse their names and titles in the Persian character. This custom was probably first made obligatory upon them as vassals; but they afterwards continued it when they had recovered their independence, and ruled the country as far as the Brahmaputra River. Meng-tsau-mwun, having got rid of his allies, meditated a change of capital."

In 1512, Chátgáon was conquered, according to the Ráj Malá,* by the Rájah of Tiparah, who drove away Husain Sháh's garrison. Whether the Rájah of Tiparah kept it for any time is doubtful; for in 1517, "John de Sylvera was invited by the king of Arakan, and he appears to have gone to Chatigam, then a port of that king's dominions.†" Anyhow, we can now understand why Nuçrat Shah, Husain Sháh's son, should have invaded Chátgáon; but although popular belief ascribes to his invasion the first Muhammadan settlements in the District, it is clear from the preceding that his invasion cannot have been the first.

It is not known how the District was again lost; but during the troubles of Sher Sháh's revolution, the Mughul invasion, the aggressions of the Portuguese, and the Bengal Military Revolt, Chátgáon did not belong to Bengal. If, therefore, Todar Mall in 1582 included it in his rent-roll, he did so on the principle on which he included Kalinga Dandpát and Sirkár Rájahmandrí in the rent-roll of Orísá §

The Eastern Frontier.

The eastern frontier of Muhammadan Bengal extended from Sunnárgáon and the Megna (but in Sháhjahan's reign, from the Phaní River over southern and western Tiparah) northward, and then passed to the east including the District of Silhat. The boundary passed along the southern slopes of the Jaintiah, Khasiah, and Gáro Hills to Mahall Sherpúr in northern

- Journal, A. S. Bengal, Vol. XIX, for 1850, pp. 545, 546.
- † Vule Sir A Phayre's History of Pegu, J. A. S. B., 1873, pt. I, 127.
- ‡ For particulars vide my extract from the Táríkh i Hamídi in Journal, 1872, Part I, p. 336.
- § "From Satagam [Sátgáon-Húgli] I travelled by the country of the king of Tipara, with whom the Mogen [Mags] have almost continual warres. The Mogen which be of the kingdom of Recon [Rakhaing, Arakan] and Bame [Rámú], be stronger than the king of Tipara, so that Chatigan, or Porto Grando, is often times under the king of Recon." 4th Ralph Fitch.

Muhammadan historians spell the word 'Rakhaing' رخنگ, Rakhang, or give the still shorter form خ Rukh, whence De Laët's "Roch, on the borders of Bengala."

Maimansingh to the right bank of the Brahmaputra near Chilmárí, and from here along the river to Mahall Bhítarband, which formed the north-east frontier. The sirkárs that lay along the boundary were Sunnárgáon, Bázúhá, Silhat, and G'horág'hát; and the neighbouring countries to the east were Tiparah, Kachhár (the old Hirumba), the territories of the independent Rájahs of the Jaintiah, Khasiah, and Gáro Hills, and, on the left bank of the Brahmaputra, the Karíbárí Hills, the zamíndárs of which were the Rájahs of Sosang. They depended in reality on the powerful kingdom of Koch Hájo,* the 'Azo' or 'Asoe' of old maps, which extended along the left bank of the Brahmaputra to Kámrúp. In the Karíbárí Hills, the Muhammadans possessed, opposite to Chilmárí, the old frontier thánah Hatsilah, which Rennell still marks as 'Hautchella.' The north-eastern frontier was never absolutely fixed. Barítalah, on Van den Broucke's map Bareithella, was looked upon as a frontier town till the beginning of Aurangzib's reign.

The invasions on the part of the Asamese were as numerous as the inroads of the Muhammadans into Asám, which had commenced under the successors of Bakhtyár Khiljí. During the reigns of Rájah Káns and his son, the Asamese under Chudangpha (A. D. 1414 to 1425) conquered north-eastern Bengal as far as the Karataya;† and as about the same time Jaunpúr was at the height of its power, successfully encroaching on the western frontier, and the Rájahs of Tiparah made likewise invasions,‡ we may assume that Bengal under the kings of the Káns dynasty was most circumscribed. With the restoration of the Ilyás Sháhí dynasty (about A. D. 1440) and the gradual downfall of Jaunpúr, Bengal recovered her ancient limits, and entered upon her most flourishing period. The invasion of Husain Sháh into Kámrúp is well known; § but Kámrúp was only permanently annexed in 1637, when Gauhattí became the north-eastern frontier of Bengal.

Silhat, as we shall see below, was conquered in A. D. 1384, and the earliest inscription hitherto found there, belongs to the reign of Yúsuf Sháh (A. D. 1480). North-western Silhat had the name of Láúd, or Láúr, and the thánah which the Muhammadans established there, was under the commander of the 'Iqlim Mu'azzamábád,' 'the territory of Mu'azzamábád,' also called 'Mahmúdábád.' The exact extent of Mu'azzamábád is still unknown; but the name occurs on coins and on Sunnárgáon inscriptions, once in conjunction with Láúr, and once with Tiparah, and it seems, therefore, as if the "iqlim" extended from the Megna to north-eastern Maimansingh and

Vide Journal, A. S. Bengal, Part I, 1872, p. 58.

[†] So according to the Asam Burauji; vide Useful Tables, p. 278.

¹ Rájmálá, J. A. S. B., XIX, 1850, p. 542.

[§] J. A. S. B., 1872, Part I, pp. 79, 835.

the right bank of the Surmá. In the Kín, we find, indeed, under Sirkár Sunnárgáon, a Mahall Mu'azzampúr, the chief town of which lies between the Brahmaputra and the Lak'hia and bears the same name. The present inhabitants, as Dr. Wise tells me, know nothing of its ancient renown; and the only old building is a ruinous dargáh, called after a saint Sháh Langar, the impression of whose foot draws crowds of pilgrims about the time of the I'd ulfitr festival. The saint is said to have come from Egypt.

The thánah Láur is also mentioned in the A'in as a Mahall of Sirkár Silhat, which consisted of Partábgarh; Panchkhand; Banyánchang; Bajúá Bayájú (?); Jaintia; Hawell Silhat; Satrk'handal; Láúd;* and Harinagar. The author of the Haft Iqlim calls Silhat repeatedly — Srihat, and this forms explains perhaps the 'Reino Sirote,' which De Barros and Blaev give instead of 'Silhat' (vide Pl. IV). The town of Sirote is correctly placed on the right bank of the Surmá, which leaves no doubt as to the identity of both names.

Kámrúp, which also appears under the names of Kámrúd, Kámrú, and Kánwrú, is often mentioned together with Kámatá.† The Brahmaputra which Ibn Batútah calls the 'Blue River', is correctly described by the old traveller as coming from the mountains of Kámrúp. De Barros, however, and Blaev give the river the name of Caor, and show it as flowing from the Reino de Caor, north of Comota and Sirote. Wilford identifies Caor with "Gcda or Gaur, i. e. Gorgánw," meaning G'hargáon, the capital of A'sám. But G'hargáon (which is the correct spelling) was only built by Chu-klunpha, between A. D. 1549 and 1563, i. e. at a time when the materials had long been sent to Europe from which De Barros in Lisbon wrote his book. It seems, therefore, more natural to compare 'Caor' either with 'Gaur,' the old name of northern Silhat, and which under the form of Gor is placed by Blaev north of Bengal, or with the name of the Gáros who inhabit the hills near the bend of the Brahmaputra.1

The south-east frontier was Tiparah, or Tripura, spelt on old Muhammadan inscriptions *Tipurah*, whence perhaps the form Tipora given by De Barros and Blaev. Abulfazl, in the Ain i Akbari, says—"Tiparah is independent; its king is Bijai Manik. The kings all bear the name of Manik,

- So at least according to some MSS. Vido my toxt edition, p. 406, where معرفه is a misprint for معتر کهندل. Láur lios at the foot of the hills.
- † For Kámatá vide below. Husain Sháh is said to have invaded Kámrúp and Kámatá; and the Kín says, Kámrúp and Kámatá are in the possession of the Rájah Koch Bihár.
- ‡ Regarding Wilford's identification of Sirote, vide Asiatic Researches, XIV, pp. 387,436. The places which Blacy gives between Gor and Caor, as Kanduana, Mewat, &c., are mentioned below.
- § According to the Rájmálá, the kings of Gaur had conferred this title on the Tiparah Rájahs. It is impossible to reconcile the discrepancy between the Rájmálá and the Kín as regards the time when Bijai Mánik reigned. According to the Kín

and the nobles that of Náráyan." The military power was estimated at 200,000 foot and 1,000 elephants; and numerous invasions of Silhat and Sunnárgáon by the Rájahs of Tiparah are mentioned in the Rájmálá. The old capital was Udaipúr, or Rángámáti, on the left bank of the Gúmtí. Hence Van den Broucke speaks of 'Oedapoer and Tipera;'* but on his map he places between Tipera and the Brahmaputra, above Bolua, the "Ryk van Udesse," which is not marked on the maps of De Barros and Blaev. As he does not mention Udesse in his text, the name is either a mistake for Udaipúr, or he has been misled by his countryman De Laët, who says, "Udessa, or Udeza, whose metropolis is Jokanat or Jekanat, the furthest province of this empire to the eastward, is adjacent to the Mag kingdom, whose inhabitants are most ferocious barbarians," and who thus places Orísá (Odesá)

The western and southern portions of Tiparah are included in Todar Mall's rent-roll in Sirkár Sunnárgáon; but they were only conquered, according to Grant, in Sháhjahán's reign; and in A. D. 1728, we hear of a re-conquest, when the district was placed on the rent-roll under the name of Raushanábád.

Before going further, I have a few words to say on the country of Jájn a gar, which Stewart, Stirling, Dowson, and Thomas agree in identifying with Tiparah. Stewart and Dowson, however, also apply the name to a portion of Orísá, and compare the word with the name of the town of Jájpúr, north-east of Katak, on the Baitaraní. Jájnagar is mentioned as a country full of wild elephants (مرغزا فيك) in the Tabaqát i Náçirí, and the two Tárikh i Fíruz Sháhís, i. e. up to about A. D. 1440, after which the name disappears. It also occurs in the Aín; but the passage refers to the reign of Hoshang of Málwah (A. D., 1405 to 1434).†

It is first mentioned as lying, together with Bang, Kámrúd, and Tirhut, near the kingdom of Lak'hnautí; ‡ and when Tughán Khán ('Izzuddín Abul Fath Tughril) invaded Jájnagar, he left Lak'hnautí city in Shawwál, 6½1, and arrived after about a month, on the 6th Zí Qa'dah, at Katásan, the frontier of Jajnagar. § In the following year, 6½2 [A. D., 12¼4], the Rái of Jájnagar invades the kingdom of Lak'hnautí, and first seizes on Lak'hnor, which above was identified with Rájha (west of the Húglí), where he kills the jágírdár Fakhruddín Lágharí, and then marches on Lak'hnautí.

he would have reigned towards the end of the 16th century; but the Rájmálá places his reign much earlier. Journal, Vol. XIX, for 1850, p. 546.

- * "The countries of Oedapoer and Tiparah are sometimes independent, sometimes under the great Mogul, and sometimes even under the king of Arakan."
 - † It may be that Dak'hin historians use the term to a later period.
 - 1 Tab. Nácirí, p. 163.

and Jagarnáth near Arakan.

1873.7

§ Loc. cit, p. 244. Katásan has not been identified. The MSS. have also Katás, and Katásín.

This remark would seem to shew that, in the opinion of the author of the Tabaqát, Jájnagar lay somewhere west or south-west of the Bardwán and Húglí Districts, i. e. in Jhárkhand, or Chutiá Nágpúr.

The next invasion, on a large scale, was undertaken by the Emperor Balban, who in his pursuit of Sultán Mughís, about A. D. 1280, marched from Lak'hnautí to Sunnárgáon, the independent Rái of which makes himself responsible not to let Mughís escape either by land or by water. From Sunnárgáon,* Balban arrives, after a march of 60 or 70 kos, at the confines of Jájnagar, where Mughís is surprised and killed.

From this remark by Baraní, Stewart, Stirling, Thomas, and Dowson† conclude that Jájnagar corresponds to Tiparah; and the eastern parts of Hıll Tiparah certainly lie about 70 kos from Sunnárgáon. The Rájmálá, however, does not state that Tiparah had the name of Jájnagar.

Jájnagar is again mentioned during the reign of Ghiyásuddín Tughluq, when Ulugh Khán, in 1323 A. D., invades Talinga, Jájnagar, and Bedar; ‡ and lastly, when Fírúz Sháh, after his second unsuccessful invasion of Bengal to conquer Sikandar, returns, in 1360, from Hazrat Panduah to Zafarábád and Jaunpúr,§ where he stays during the rainy season. He then marches over Bihár to Jajnagar; arrives at Satgarh (?), the Rái of which retreats; then comes to Báránasí, the residence of a great Rái; crosses the Mahindrí, and goes for some distance into Talinga, to which country the Rái had fled. Fírúz Sháh then retreats, passes through the country of Rái Paríhán [Bir Bhán Deo, Lucknow Edition], and arrives in Padmáwatí and Baramtalá, great fields for elephants, and returns quickly to Karah.

Lastly, in the Kin (my text edition, p. 472, l. 6), Hoshang of Málwah goes in disguise to Jájnagar, in order to obtain elephants.

In these passages it is clear that Jájnagar represents a country between Talinga and Bihár, or, as expressed in the Tabaqát, west of Rárha, i. e., the

- * Baraní, p. 87. The Bibl. Indica Edition has Hájínagar, Jájínagar, and (once) Jáinagar.
- † History of India, Vol. III, pp. 112, 113. The Bibl. Indica Edition of Badáoní, I, p. 129, calls Mughís wrongly Mu'izz, and says that he had gone towards Jájnagar and Tárkílah (or Nárkílah, as the Lucknow edition of Badáoní has).
 - 1 Badáoní, I, 223. Dowson, III, 234. Baraní, 450.
- § Zafarábád, which is so often mentioned by Muhammadan historians, lies on the right bank of the Gúzntí, a little below Jaunpúr, which lies on the left bank. The maps give, of course, Jaffurabad.
- || Badáoní, I, 247. Dowson, III, 312 to 316. Dowson has Banárasí, for Báránasí; and Firishtah (Lucknow edition, p. 147) has 'Banáras, which is the residence of the Rái of Jájnagar.'

Katak is called in the Ain 'Katak Banáras;' and from the account translated by Dowson from 'Aiii it is clear that south-western Orisá is meant, although the comparison of Jájnagar and Jájpúr may be redundant. Rennell in his Bengal Atlas (Map VII) gives a Baramtalá in Singhbhúm, near northern Mayurbhanj.

wild districts of western Orisá, Chutiá Nágpúr, and the eastern portions of the Central Provinces, of which Ratanpúr, Bastar, and Sirguja are also mentioned in the Aip as hunting places for wild elephants. But it is remarkable that Barani, in relating Balban's expedition, places Jájnagar 70 kos beyond Sunnárgáon, whilst in his account of Tughluq Sháh's reign he gives the same name to a district near Talinga; and we are forced either to believe that there were two Jájnagars, one famous for elephants near south-western Bengal (Tabaqát i Náçirí, Baraní, Fírúzsháhí, Aíp), and another in Tiparah or south-eastern Bengal (on the testimony of a single passage in Baraní); or to assume that there was in reality only one Jájnagar, bordering on south-western Bengal, and that Baraní in the above single passage wrote Sunnárgáon by mistake for Sátgáon,* which would remove all difficulties.

The Northern Frontier.

From Bhítarband, near the bend of the Brahmaputra, and in later times from Gauhattí in Kámrúp over K'hontag'hát, the frontier passed along the southern portions of Koch Bihár to Mahall Pátgáon, or Pátgrám (west of Koch Bihár), which is mentioned by Mughul historians as the frontiertown in the extreme north, and from there along the foot of the hills and forests of Sikkim and Nepál to the northern portions of Púrniah District. Thus by far the greater portion of what is now-a-days called the Koch Bihár Division, did not belong to Bengal.

The Sirkárs along the northern frontier were G'horág'hát, Panjrah, Tájpúr, and Púrniah.

The inhabitants of northern Bengal according to the Tabaqát i Náçiri were the Koch, Mech, and Thárú tribes, whose Mongolian features struck the first invaders as peculiar.†

The Rájahs of Northern Bengal were powerful enough to preserve a semi-independence in spite of the numerous invasions from the time of Bakhtyár Khiljí, when Debkot, near Dínájpúr, was looked upon as the most important military station towards the north.

During the fifteenth century, the tract north of Rangpur was in the hands of the Rájahs of Kámatá (نامال), to which country passing allusion was made above. The kingdom is prominently marked as 'Reino de Comotah,' or Comotay, on the maps of De Barros and Blaev' (Pl. IV). The town of

- * Barani's statement of the distance of 70 kes would admirably suit Sátgáon; it would bring us to Mayurbhanj and western Chutiá Nágpúr.
- † For 'Thárú' Stewart has Neharu, but there can be no doubt that the author of the Tabaqát means the Thárús of Mithila. Vide Dalton, Ethnology of Bengal, p. # 126; J. A. S. B., 1872, Part I, p. 66.

The Pádisháhnámah says of the Asamese also that they resemble in features the Qaráqalpáks of southern Siberia.

Kámatá, or Kámatápúr, lay on the eastern bank of the Darlá river, which flows south-west of the town of Koch Bihár, and joins the Brahmaputra near Bagwah. The river near its confluence with the Brahmaputra, separates mahall Bhítarband from Báhirband. The town itself and the Darlá river are correctly marked on the old maps. Buchanan estimated the circumference of Kámatápúr at nineteen miles; the palace, as in the case of Burmese and Chinese towns, stands in the centre. History informs us that Kámatá was invaded, about 1498 A. D., by Husain Sháh, and legends state that the town was destroyed and Nilamba, the last Kámatá Rájah, was taken prisoner. He escaped, however, and disappeared; but people believe that at some time in future he will be restored.

The Kámatá family was succeeded by the Koch dynasty, to which the present Mahárájá of Koch Bihár belongs. The new Rájás secured their possessions by creeting along the boundary a line of fortifications, many of which are still in excellent preservation.

The prevalence of human sacrifices in Koch Bihár is known from the Kin. The Haft Iqlim has the following: "There is a cave in this country, which, according to the belief of the people, is the residence of a Deo. The name of the Deo is Ki, and the people are zealous in their worship. Once a year they have a feast, when they kill all sorts of animals found in the country, believing that the meritoriousness of the slaughter comes from Ki. They likewise kill on the same day the Bhogis, who are a class of men that have devoted their lives to K1, saying that Ki has called them. From the time they become Bhogis, they may do what they like; every woman is at their command, but after one year they are killed."

The first European traveller that visited Koch Bihár was Ralph Fitch. He says: "I went from Bengala into the country of Couche or Quicheu, which lies 25 days' journey northwards from Tanda. The king is a Gentile; his name is Suckel Counse;* his country is great and lieth not far from Cauchin China: for they say they have pepper from thence. The port is called Cacchegate.† All the country is set with bamboos or canes made sharp at both endes and driven into the earth, and they can let in the water and drown the ground above knee deep, so that men nor horses can pass. They poison all the waters if any wars be. Here they have much silk and musk and cloth made of cotton. The people have ears which be marvelous great, of a span long, which they draw out in length by devises when they be young. There they be all Gentiles, and they will kill nothing. They have

Shukl Gosáin; vide my essay on Koch Bihár and Asám, Journal, As. Soc. Bengal, 1872, Part I, p. 53.

[†] I. e. the place where the merchants from China meet. Caochegate is Chichéatotá, north of the town of Koch Bihár and south of Baksa Fort, Long. 89° 85', in the Bengal Dúárs. It is now British.

hospitals for sheep, goats, dogs, cats, birds, and for all living creatures. When they be old and lame, they keep them until they die. If a man catch or buy any quick thing in other places and bring it thither, they will give him money for it or other victuals, and keep it in their hospitals or let it go. They will give meat to the ants. Their smal mony is almonds, which often times they use to eate."

As Ralph Fitch mentions Chichákotá, and the 'Alamgirnámah Kanthalbári,* as belonging to the Koch Bihár, it follows that portions of the Duárs must have once belonged to Koch Bihár.

Aurangzib's army under Mír Jumlah took Koch Bihár on the 19th December, 1661, when the town was called 'Alamgírnagar,† a name which has not come into use; and the imperial collectors expected to raise a revenue of eight lák'hs of rupees, whilst in Prince Shujá's rentroll of 1658 Koch Bihár is put down as yielding Rs. 3,27,794.

On Van den Broucke's map, the whole Himálaya tract, from northern Bihár to Asám, is called 'T Ryk van Ragiawarra,' or the realm of Rájáwárá and in the text he says, that "Ragiawara consists of several separate countries, which sometimes fight the Great Mogul, and at other times are forced to submit." Of these several countries he mentions on the map T Ryk van Morang and 'T Ryk van Jesval, which latter name is also given on Blaev's map and will be remarked on below.

The Morang was entered by Mughul troops in the beginning of Aurangzib's reign. We first hear of an expedition led by Mirzi Khan, Faujdar of Darbhanga, and Ilah Virdi Khan, Faujdar of Gorák'hpúr, against the refractory zamindar of Morang (beginning of 1075, or end of A.D. 1664). Mirzi Khan died during the expedition; but Ilah Virdi Khan returned with fourteen wild elephants and nine presentation elephants. In the end of 1079 (beginning of 1669), Ma'çum Khan reported that a false Shuja' had appeared in Morang and had caused disturbances there, and Ibrahim Khan and Fidai Khan received orders to capture him wherever he shewed himself, and to send his head to Court. Lastly, in 1087 (beginning of 1676), we hear of a conquest of Morang, but no particulars are given.

^{*} West of Kanthalbárí, the maps give a place called Mogulmurri [Mughalmárí], evidently the scene of a fight with Mughul troops. Another Mughulmárí lies between Bardwán and Jahánábád; a third between Medinípúr and Jalesar, where Akbar's troops defeated Dáúd Sháh (Kíu translation, p. 376); and a fourth, eight miles north of Medinípúr.

[†] Thánah Sangramgarh, one of Aurangzíb's frontier thánah near Noák'hálf, had received the same name in allusion to the title of the emperor.

^{1 &#}x27;A'lamgirnámah, pp. 850, 875. Maásır i 'A'lamgiri, pp. 64,150.

Blaev's Map of Bengal and of the Mughul Empire.

The map of Upper India by William and John Blaev (Pl. IV) is taken from their "Theatrum Orbis Terrarum," Amsterdam, 1645 to 1650, Vol. II,* and is based upon the Portuguese and Dutch charts that existed at the time, and upon the descriptions of European travellers. As far as Bengal is concerned, it is a reprint of De Barros' map, and represents, therefore, the knowledge which European geographers had of Bengal about 1540. In point of accuracy it is much inferior to Van den Broucke's map of 1660,† given in Valentyn's work. But the map is of great interest, as it helps us to unravel the difficulties in Terry's enumeration of the provinces of Bengal and other portions of the Dihli empire,‡ which has also been followed by the Dutch traveller De Laët in his "India Vera" (Amsterdam, 1631), and of which traces may still be found on Van den Broucke's map. It is with a view to explain the extraordinary configuration of Bengal on the old maps that I have given the present chapter a place in this essay.

From a glance at the map, it will be seen that our early geographers had no information of the extent and situation of the countries which we now-a-days call the Central Provinces and Chutiá Nágpúr. Hence Gwáliár, Narwar, and (on Van den Broucke's map) Málwá, bound Bengalon the west; the Santál mountains are continued eastwards to meet the Ásám mountainchains, and places belonging to the Central Provinces have been put north of Bengal.

Terry enumerates the following provinces as belonging to the Mughul empire—1. Candahore, Qandahár; 2. Cabul; 3. Multan; 4. Haiacan, Hájikán, a sirkár of Sindh; 5. Buckor, Bhakkar; 6. Tatta; 7. Soret with Jonagar, Sorat'h with Júnágarh; 8. Jesselmeere; 9. Attok; 10. Peniab, Panjáb; 11. Chishmeere, Kashmír; 12. Banchish, "the chief city is called Bishur; it lyeth east, somewhat southerly from Chishmeere, from which it is divided by the River Indus." Here we have the first misplacement. Terry means Bangash and Bajor (Sawád, Swat); but for East, he should have said West.

- Capt. J. Waterhouse drew my attention to a copy of this work in the Library of the As. Society.
- † Mattheus Van den Broucke was Land-Voogd, or governor, of Choromandel, which included Bengal, from 1658 to 1664, during which time he compiled the map in the Vth Volume of the 'Beschryving van Choromandel' in François Valentyn's 'Oud en Niew Oost Indien', Amsterdam, 1728. (Library, As. Soc. Bengal, No. 2266.)
- ‡ Edward Terry was chaplain to Sir Thomas Row, the Ambassador to Jahángir's Court, and was later Rector of the Church at Greenford, Middlesex. He presented his 'Voyage to East India,' in 1622, shortly after his return to England, to the then Prince of Wales; but he only published it in 1655, when he was sixty-four years old.

- Jangapore, "the chief city so called; it lieth upon the River Kaul. one of those five rivers which water Peniab." (?) De Laët has 'Jengapor or Jenupar,' between Lahore and Agra. 14. Jenba, ceast of Peniab, Chamba. 15. Dellee,* Dihli. 16. Bando; 'it confineth Agra to the west.' This is Bándhú, or Bándhúgarh, south-east of Agrah. 17. Malwa; 18. Chitor; 19. Gujarat; 20. Chandis, Khándesh; 21. Berar, with the chief city Shapore; † 22. Narwar; 23. Gwaliar; 24. Agra; 25. Sambal, Sambhal, or Murádábád District. 26. "Bakar, the chief city called Bikancer, it lyeth on the west side of the River Ganges." The whole remark seems to be erroneous. 27. Nagracot, Nagarkot or Kangrah. 28. Siba, "the chief city is called Hardware.1" 29. Kakares, the principal cities are called Dekalee and Púrhola." Terry means the Gakk'har District, the chief cities of which were Dángalí and Pharwálah; vide Aín translation, p. 621. Terry also remarks that the Caucasus (Himálaya) divides Kakares from Tartaria, which accounts for its northern position on Blaev's map. 30. Gor, "the chief city so called; it is full of mountains; the River Sersily, a tributary unto Ganges, has its beginning in it." Vide 32.
- 31. Pitan, "the chief city so called; the River Canda waters it, and falls into the Ganges in the confines thereof." This is Paithán, the form used by Abulfazl for Pathán, or Pathánkot. Terry evidently means the whole hill tract of the Sirmúr range, as far as the Alaknandá. It is, however, possible that he meant the Markandá; but this river does not flow into the Ganges. The error in the position of Pitan is remarkable, as Terry, DeLaët, and Blaev give Temmery (a Dutch spelling for Dhameri, the old name of Núrpúr, near Pathánkot) between the Ráví and Nagarkot (Kángrah).
- 32. Kanduana, "the chief city is called Karhakatenka; the River Sersily parts it from Pitan. This and Gor are the north-east bounds of this Monarchy." There can be no doubt that Kanduana is Gondwánah (Central Provinces), of which the capital is Garha-Katanga (Jabalpúr); vide Kintranslation, p. 367. If Gor is the north-east boundary of the empire, it is the Gaur of Silhat, mentioned above, or the Gáro Hills. Sersily is a misprint for Sersity, the Saraswati, which after the Jamuná is the principal (legendary)
- "Which signifies an Heart, and is scated in the heart of the Mogul's territories."

 Terry. This unfortunate etymology shows however that Terry knew some Persian, because he cleverly disposes of the final yá. Similarly, he derives 'Khusrau,' from and 'Sultán Khurram' from 'Karam, liberality!
- † Sháhpúr, built by Sultán Murád, Akbar's son, six kos south of Bálápár, now in ruins.
- ‡ I do not know whether the country near Haridwar was ever called Siba, In the Kin, a parganah of the Bisat Jálandhar Dúáb is called Sibah.

tributary of the Ganges. The map follows the legend and makes the Saraswati flow into the Ganges near Helobass (Iláhbás, the old name of Iláhábád).* De Laët increases the confusion by calling the Sersily 'Perselis.' But the passage need no longer exercise commentators. Blaev's map clearly shows how erroneously the early geographers arranged the provinces.

- 33. Patna, "the chief city so called; the River Ganges bounds it on the west; Sersily on the east; it is a very fertile Province."
- 34. Jesual, "the chief city is called Raiapore; it lieth east of Patna." Van den Broucke puts Jesual east of Morang; and Blaev's map marks it as a country for elephants. It seems, therefore, that Ráipúr in the Central Provinces is meant, the elephant country par excellence, though the name 'Jesual' is not clear to me.
- 35. Mevat, "the chief city is called Narnol; it is very mountainous." This is Mewát, south-west of Dihlí, with Nárnol. I am at a loss to understand how Mewát could have been placed so far away from Dihlí; but Blaev's map shows why Terry and De Laët mention it here. The error was not even detected by Van den Broucke, who places 'T Ryk van Mewat east of the Brahmaputra, south of 'Cos Assam.'†
- east of this empire." De Laët says: It is the furthest province of this empire to the eastward, is adjacent to the Maug kingdom, whose inhabitants are most ferocious barbarians." DeBarros and Blaev have avoided this mistake; Van den Broucke, however, places "T Ryk van Udesse north of Bollua (Bhaluah), between Tiparah and the Brahmaputra. But Orisá and Jagannát'h are meant. The spelling Udessa is clearly a transliteration of "Orisa," Udesa, and DeLaët has overlooked the identity of 'Orisa' and 'Udessa.'

37. Bengala.

It would take me too far from my subject, were I to enter on the identification of the places in western India on Blaev's map. I hope to do so at a future period, or would rather leave the task to Mr. E. Lethbridge, who has lately published valuable extracts from De Laët's work in the Calcutta Review.

- According to the legend, the Saraswati, which is lost in the sand east of Bhatinda District, joins the Ganges below the ground at Iláhábád. Hence at Tribení and other places in Bengal, wherever two rivers leave the Ganges, we find the names Saraswati and Jamuná repeated.
- † The London edition of 1655 has 'Jesuat.' De Last has "Jesual, whose metropolis is Raiapore or Ragapore, lies to the east of Patna, and north-west of Bengala."
 - 1 Asam is often called Koch Asam.

PART II.—HISTORICAL.

The Muhammadan period of the history of Bengal may be conveniently divided into five parts—

- I. The 'Initial period,' or the reigns of the governors of Lak'hnauti appointed by the Dihli sovereigns, from the conquest of Bengal by Muhammad Bakhtyár Khilji, A. D. 1203 to 1338 A. D.
 - II. The period of the independent kings of Bengal, from 1338 to 1538.
- III. The period of the kings of Sher Shah's family and their Afghan successors, from 1538 to 1576.
 - IV. The Mughul period, from 1576 to 1710.
- V. The Nawabi period, from the accession of 'Ali Virdi Khan, in 1740, to the transfer of Bengal to the E. I. Company.

In the following pages, I shall principally treat of the first and second periods.

I.

THE INITIAL PERIOD (1203 TO 1338, A. D.)

The first period has been almost exhaustively described by Mr. E. Thomas in his 'Initial Coinage of Bengal,' published in the Journal for 1867, in which he details the results of his examination of selections made from 13,500 pieces of silver, accidentally found in Koch Bihár in August, 1863. I can, therefore, with regard to this period, merely give a few interesting inscriptions which have since turned up, and note a few coins—second gleanings from the Koch Bihár trouvaille—which are in the Society's cabinet.

Of the following inscriptions belonging to the Initial Period, one was received from General Cunningham, and the others from Mr. Broadley, who handed over to the Society in all twenty-two rubbings, which I have deciphered and translated. The original stones are either attached to old public buildings in the town of Bihár, or are preserved in the Museum of that place.

No. 1. The Tughrel Inscription of Behar. [B. C.]

امر ببناء هذه العمارة في ايّام مملكة المجلس العالي خان الاعظم خاتان العظم خاتان العظم خاتان المعظم عزّالحق و الدّين غياث الاسلام والمسلمين مغيث الملوك والسّلاطين ابى الفتح طغرل السلطاني خلّد الله ملكه العبد مبارك خان الحارس تقبّل الله منه في المحرّم سنة اربعين و سنّماية اا

* Together with the rubbings, Mr. Broadley made over to the Society readings of several early Muhammadan coins of importance, and also a few notes on the Muhammadan buildings of the town of Bihar. The coins have since passed into the collection of Col. Guthrie, and have been published by Mr. E. Thomas in his 'Second Part of the Initial Coinage of Bengal' (about to be reproduced in this Journal). The "notes"

This building was ordered to be erected during the days of the reign of the Majlis i'Klí, the great Khán, the exalted Kháqán, 'Izzul haq waddín, the help of Islám and the Muslims, the helper of princes and kings, A bul Fath Tughril, the Royal, may God perpetuate his reign! The slave, Mubárak Khán, the Treasurer,—may God grant acceptance!

In the month of Muharram, 640, [July, 1242, A.D.]

The inscription is a large slab of basalt, and is at present in the Bihár Museum. It was found let into brick work on the north side of the great Dargáh, to protect the doorway from rain. A photozincograph of it was published by me in this Journal for 1871, Pt. I, Pl. vii.

It is of interest to remark that South Bihár was under the Lak'hnautí governors from Bakhtyár Khiljí's time.

Tughril in 631 (A. D. 1233-34) succeeded Saifuddin Aibak as governor of Lak'hnauti, in which office he continued till the 5th Zi Qa'dah 642 (or 4th April, 1245), on which day he was forced to code his office to Qamaruddin Timur Khán. Tughril was appointed to Audh; and Timur Khán remained in Lak'hnauti till 29th Shawwál, 644, (or 9th March, 1247) on which day both he and Tughril died.*

The following are the governors of Bengal from Saifuddin Aibak to Bughrá Khán. The dates differ slightly from Mr. Thomas's list on p. 8 of his 'Chronicles.'

Saifuddin Aibak. Dies at Lak'hnauti in 631. Tubq., p. 239.

'Izzuddín Abul Fath Tughril Tughán Khán, governor from 631 to 5th Zí Qa'dah, 642. Tabq., p. 245. He withdraws to Audh, and dies on the 29th Shawwál, 644.

Qamaruddín Timur Khán, governor from 5th Zí Qa'dah, 642, to 29th Shawwál, 644, when he, too, dies. Tuby., p. 216.

Ikhtiyáruddín Yúzbak Tughril Khán, proclaims himself king under the title of Sultán Mughísuddín. Perishes in Kamrúp. *Tabq.*, p. 263. No dates are given.

Jaláluddín Mas'úd, Malik Jání Khilji Khán, becomes governor on the 18th Zi Qa'dah, 656 (or 17th Nov., 1258). Tabq., pp. 206, 225.

'Izzuddín Balban, was governor in 657, in which year he was attacked by Tájuddín Arsalán Khán Sanjar i Khwárazmí, who, however, was captured or killed by 'Izzuddín. Tabq., p. 267.

are of little value, and are moreover incomplete, so that I can only give my readings and translations of the Bihár inscriptions. They are marked 'B. C.' (Bihár Collection.)

* Tabaqát i Nágiri, pp. 245, 246, where Tughril is called Tughril Tughán Khán. Hence the táríkh on p. 246 is wrong, and for sín we have to read mím. 'Tughril' signifies a kind of falcon or hawk, and fughril shudan, like shungár shudan, means 'to die,' 'Shungár' also is a kind of falcon.

† Hence Tajuddín Arsalán Khán should not be put among the governors of Bengal.

Muhammad Arsalán Tatar Khán, son of Arsalán Khán Sanjar. He had been for some time governor, when the emperor Balban ascended the throne (664). *Baraní*, p. 66. After a few years he was succeeded by

Tughril, who proclaimed himself king under the name of Sultan Mughisuddin. His fate has been mentioned above. No dates are given.

Bughrá Khán, Náciruddín Mahmúd, second son of emperor Balban.

No. 2. The Bárahdarí Inscription of Bihár. [B. C.]

This inscription also belongs to the time of the early governors of Bengal; but unfortunately the first half with the name of the governor is wanting. Its date however, A. H. 663, shews that it belongs to the time of Muhammad Arsalán Tatar Khán, governor of Bengal in the end of the reign of Náçiruddín Mahmúd of Dihlí. The inscription was found in the yard facing the shrine of Sháh Fazlullah, Bárahdarí Mahallah, Bihár.

الله و إمارته و إبقي في دبار الممالك عمارته ببناء هذه المقبرة المتبركة شهرسنة و م م العدل الرافة المخصوص بعداية الرحمن م مسلطان شاه نور اللهم تربته و بيض غرته و إجعل قبرة روضة من رباض الجنان و لا تجعل حفرة من حفر النيران في ليلة الاحد الثامن عشر من جمادى الاولي سنة ثلاث و ستين و ستماية و المعمار عبدهما الكابلي الممنون بانعامهما مجد الكابلي ال

** may God (perpetuate) his rule and governorship, and may He cause his edifice to remain in the real m ** by the crection of this blessed tomb in the months of the year ** Sultán Sháh, (() God, illuminate his grave, and whiten his forchead, and make his grave a garden of the gardens of Paradise, but do not make it a pit of the pits of fire!). On Saturday evening, the 18th Jumáda I, 663. The architect is their slave, who is obliged by their rewards, Majd of Kábul. [8th March, 1265.]

No. 3. The Kai Káús Inscription of Kagol. Pl. V, Nos. 1 and 2.

A rubbing of this inscription was received from General Cunningham. Its date is, curious to say, the same as that of the Kai Káús inscription of Gangarámpúr, published by me in the Journal, for 1872, p. 103. Mr. Thomas has published coins of this king, bearing the dates 691, 693, 694, 695 (Chronicles, p. 119), and the cabinet of the As. Soc. of Bengal contains two clear specimens of 691, and 696 (Lak'hnautí mint).

The inscription is-

وقو (؟) لبناء هذا المسجد الجامع في عهد الدولة السلطان المعظم مالك رقاب الامم مولي ملوك الترك والعجم صاحب التاج والخاتم ركن الدنيا • • • • س شاة السلطان بن سلطان بن سلطان يمين خليفة الله ناصر امير المؤمنين في نوبت الخان الاعظم خاقان المعظم اختيار الحق والدين خان الشرق والصين سكندر الثاني فيروز ايتكين السلطان The text has a dual.

ُحلَّد اللَّه دولته * * * * المظلَّفر المذصور الغاري ضياد الدولة والدَّين ُ الغ خان ادام اللَّه دولته وزاد خيرة في الغَّرَة من العَرَّم سنة سبع و تسعين وستماية ا

This Jámi' Mosque was built during the reign of the great Sultán, the owner of the necks of nations, the master of the princes of the Turks and the Persians, the lord of the crown and the signet, Ruknuddunyá waddín [Kai Káú]s Shāh, the king, son of a king who was the son of a king, the right hand of God's Viceregeut, the helper of the Commander of the Faithful, and during the governorship of the great Khán, the exalted Kháqán, Ikhtiyár ul haq waddín, the Khán of the Kháns of the East and of China, the second Alexander, Fírúz Aitigín Sultán, (may God perpetuate his rule!) **[by] the victorious, the invincible, the champion, Ziyauddaulah waddín Ulugh Khán, may God perpetuate his rule audincrease his benefits! On the 1st day of Muharram, of the year 697. [19th October, 1297]*

This inscription contains what Mr. Thomas calls an unusual reiteration of the words ibnu sulfanin ibni sulfan, which is perhaps more unusual on coins than on inscriptions. But the spirit of pride that breathes in the words is apparent, when we compare with it the legend of the coins struck in Tirhut by the rebel Bahádur, given in Badáoní II, p. 298.

In Raziyah's Bengal coinage (Thomas, Chronicles, p. 107), I read for قمين which has no sense. قميدة, mumidatu, 'the helper,' the same as قصل 'Raziyah' stands for 'Raziyat unnisa,' s. c. one who among women is looked upon with favour.

I also take this opportunity to give my reading of the Naciruddin Mahmad Inscription, published by Mr. Thomas in his Chronicles, p. 129, an inscription which in style is similar to the above Kai Kaus inscription. General Cunningham has favored the Society with a rubbing of it.

[بني] هذا العمارة في عهد مملكة السلطان الاعظم مالك رقاب الامم ناصر الدنيا و الدبن سلطان السلاطين ذي الامان لاهل الايبان وارث ملك سليبان صاحب المخاتم في ملك العالم ابي العظفر صحمود بن السلطان خلد الله ملكة و سلطانه باصر الملك العالم الكبير اعظم قتلفحان بها الحق و الدين ملك ملوك المشرق و الصين بلبن الشبسي في ايام ايالته دامت معالية في العاشر من رجب سنة اتنى و خيسين و ستماية اا

'This building was erected during the reign of the great Sultan, the owner of the necks of nations, Náçiruddunyá waddín, the king of kings, who protects the people of the Faith, the heir of the kingdom of Solomon, the lord of the signet in the kingdom of the world, Abul Muzaffar Mah múd Sháh, the son of the king (may God perpetuate his rule and kingdom!), by order of the learned and great Malik, A'sam Qutlugh Khán Baháulhaq waddín, the Malik of the Maliks of the Eastern Provinces and China, Balban the Shamsi [slave of Shamsuddín Iltitmish], during the period of his governorship, may his high qualities endure! On the 10th Rajab, 652.'

From this it will be seen that A'zam Qutlugh Khán (Balban) does not call himself Malik ul'Alam 'the Malik of the world,' but almalik ul'Alam, 'the learned Malik.'

The reading of the name 'Aitigín' or 'beautiful moon,' in this inscription was suggested by Mr. Redhouse, and I gladly correct my reading Itgín in the Kai Káús inscription, published by me in the Journal for 1872, p. 103, where the correct name of the builder is Zafar Khán Bahrám Aitigín, the Royal (sultání).*

The date of this inscription is the latest yet discovered of Kai Káús's reign.

Kai Káús seems to have been succeeded by bis brother Shamsuddín Fírúz Sháh (I). Mr. Thomas quotes coins of this king, dated 702, 715, 720, 722, and the cabinet of the Asiatic Society of Bengal has three specimens, struck at Lak'hnautí, with clear dates 706 and 715, and (slightly doubtful) 710.

Three inscriptions of Firúz Sháh have hitherto been found, of which one, dated 1st Muharram, 713, or 2sth April, 1313, was published by me in this Journal, for 1870, Part I, p. 287.† The other two inscriptions are from Bihár, and are dated 709 and 715. They reveal that Fírúz Sháh had a son Hátim Khán,‡ who in those two years, and probably in the interval, was governor of Bihár.

No. 5. The Firia Sháh (I) Inscription of Bihár. [B.C.]

بنى هذه العمارة المزندة (؟) في عهد السلطان الاعظم شمس الدنيا
و الدين ابي المظفر فيروز شاه السلطان خلّد الله ملكه وسلطانه و نوبة ايالة
المخان العادل الباذل الغازي • • الحق حام خان ابن السلطان خلّد ملكه
و سلطانة العبد الضعيف محمد حسين تكهروري في شهور سذة تسع و سبعماية اا

This (additional?) building was erected in the reign of the great Sultan Shamsuddunyawaddin Abul Muzaffar Firuz Shah, the king, (may God perpetuate his kingdom and his rule!) and during the governorship of the just and liberal Khan, the champion of God, ** Hatim Khan, the son of the king, may God perpetuate his rule! The weak slave Muhammad Husain Tak'harori. During the months of the year 709. [A. D., 1309.]

A plate of this inscription was published in this Journal, for 1871, Part I, Pl. viii. The inscription itself is attached to a lofty gateway, which together with an arched hall, fast falling to decay, and a roofless mosque, forms the remains of what tradition calls Hátim Khán's palace. It stands on a gentle eminence, due east of the Bihár mountain.

[•] Or, we might at once translato, 'the Sulfán;' for sulfání, as abstract none, occurs on numerous coins; vide Proceedings A. S. Bengal, for June, 1870, p. 152. The translation of the other portions of the inscription is here confirmed.

⁺ Where in the third line for الاكرم read الاكرم.

[‡] Besides the four sons mentioned by Mr. Thomas, Chronicles, p. 148.

No. 6.

بنى هذا المسجد فى نوبة السّلطان الاعظم شمس الدّنيا و الدّين ابوالمظفّر فيروز شاة السّلطان و ايّام امارة خاقان الزّمان المحاطب بحاتم خان ادام الله ظلالهما العبد الواثق بالله و لكرمة الرّاجى احقر الخلائق بهرام بن حاجى تاب اللّه عليه و غفر لوالديه فى الغرّة من رجب سنة خمس عشرة و سبعماية اا

This mosque was built in the reign of the great Sultán Shamsuddunyá waddin Abul Muzaffar Firúz Sháh, the king, and during the governorship of the Kháqán of the age, known as Hátim Khán, may God cause their shadows to last! The slave, who trusts in God and hopes for His mercy, the meanest of mankind, Bahrám, son of Hájí, may God turn to him and may He pardon his parents!

On the first day of the month of Rajab of the year 715. [Ist October, 1315.]

This inscription, a fine slab of basalt, leans against the wall of the Chhotá Dargáh in Bihár.

Two other sons of Firúz Sháh, Shihábuddín Bughdah Sháh and the well known Ghiyásuddín Bahádur Sháh, struck coins as 'kings of Bengal' during the lifetime of their father. Of the former, Mr. Thomas says (Chronicles, p. 194)—"Neither history, incidental biography, nor numismatic remains avail to do more than prove the elevation, as they seem to indicate the brief and uneventful rule, of Shihábuddín Bughdah Sháh. No date or place of mintage is preserved." However, the cabinet of the Asiatic Society possesses two specimens,* one of the same kind as published by Mr. Thomas (Chronicles, Pl. VI, No. 4), and a new variety, containing the same legend, but with the letters, on the obverse, close together, and with a instead of the star on the reverse. The former fortunately contains a complete margin, with the clear legend—

ضرب هذه الفضة للكهذوتي سنة ثبان عشر و سبعماية

This silver coin was struck at Lak'hnauti in the year 718.

Mr. Thomas looks upon the d in the name of this king as the Hinds 5, which is so often interchanged with 3 re. This may be the case, inasmuch as Shiháb, according to Muhammadan custom, would assume the name of his grandfather بغراء, bughrá;† but in India, people seem early to have substituted a dál for the re; hence we find in the Kin the form بغدى bughdi. ±

Ghiyásuddín Bahádur Sháh was the last of the Balbani kings of Bengal.

"In A.H. 788, Muhammad ibn i Tughluq is found issuing his own coin in

[·] Evidently Bábu Rájendralála Mitra's selections from the Koch Bihár hoard,

[†] Which signifies a male 'Bactrian camel' (with two humps). The spellings given in dictionaries are بوغور - بغور

I Vide my Kin translation, p. 148.

Bengal, and Bahádur, defeated and put to death, contributed an example to insurgent governors in his own skin, which was stuffed and paraded through the province and the empire."* And already the year before, we find that a palace had been built, or renovated, in Bihár for the Imperial Náib, which tradition still calls the 'sukúnat,' or residency.

No. 7. The Sukunat Inscription of Bihar. [B.C.] بسم الله الرحمن الرحيم

شد متجدید عمارت این دروازه عالی عالم کرای و ابن طاق رفیع فلكساي در ایام خلافت خلیفای است. خلافت خلافت المیان مالیان المان و الامان لاعل الابمان وارث ملك سلیمان الو المجاهد محمد بن تغلقشاه السلطان خلدت خلافته و صلطانه في الغرة من الشهر المجارك رمضان سنة وثلاثین و سبعیایة اا

This high and world-adorning gate, and this lofty, heaven-touching portico, were renewed in the reign of the Khalifah, the asylum of the world, whose court is the heaven, the Lord of the kings of the universe, the ruler of mankind who gives security and safety to the people of the Faith, the heir of the kingdom of Solomon, Abul Mujáhid Muhammad, son of Tughluq Shah the Sultán, (may his kingdom and rule be perpetuated!). On the first day of the blossed month of Ramasán, 732, A. H. [27th May, 1332].

From this time till the beginning of the 10th century, Southern Bihár as remarked above, remained detached from Bengal, and followed the fortunes of the empires of Dihlí and of Jaunpúr.

Muhammad Tughluq's governors of Lak'hnautí, Sátgáon, and Sunnárgáon did not long remain undisturbed, and the death of Bahrám Khán, governor of the last province, was the commencement of new revolutions, which led to the establishment of a line of independent kings.

II.

THE SECOND PERIOD, OR THE PERIOD OF THE INDEPENDENT KINGS OF BENGAL (1338 TO 1538, A.D.)

For this period I shall take the kings singly, and collect for each reign whatever new information I have been able to gather from the rubbings received from General Cunningham, Dr. J. Wise, and Mr. E. V. Westmacott, C. S., and from unpublished Bengal coins in the Society's cabinet.

I have also compared the corresponding chapter of the Riyázusenlájia with the statements given in the Tabaqát i Akbari and in Firishtah.

The line of the independent kings commences with

I. Fakhruddi'n Abul Muzaffar Muba'rak Sha'h.

He had been Siláhdár, or armour-bearer, to Bahrám Khán, the Dihlí governor of Sunnárgáon, and on his master's death in 739 A. H., or 1338 A.D., proclaimed there his independence.

According to the Tabaqát i Akbarí, Firishtah, and the Riyáz ussalátín, Mubárak Sháh was killed by 'Alí Mubárak in 711, after a reign of two years and some months.* But as his coins extend over a period of more than ten years, from 739 to 750, it looks as if the date given in the histories should be corrected to to to the coins, 'ten years and some months.' Mr. Thomas is willing to antedate Mubárak Sháh's accession to 737; but the coins (Chronicles, p. 263, and Plate vi, fig. 7) do not satisfactorily prove this, because the reading the provential marks, is more likely the provential which the histories give, especially because the numerous coins hitherto found do not give the intervening year (738).

The name 'Mubarak Shah' has been proved by coins, the histories only call him Sultan Fakhruddin or more familiarly still, Fakhra,† Ibn Batútah also mentions him under the name of Fakhruddin, and says that he was an eminent man, kind to strangers and Qúfis.‡

Mubárak Sháh's son is mentioned below. His son-in-law Zafar Khán fled from Sunnárgáon over Tattah to Fírúz Sháh in Dihlí, who, at his request, invaded Bengal a second time in the beginning of Sikandar Sháh's reign.§

II. 'Ala'uddi'n Abul Muzaffar 'Ali' Sha'h.

Regarding this king the Riyazussalátín has the following:

'It is said that Malik 'Alí Mubárak, who as king is styled Sultán 'Aláuddín, was a trusted servant of Malik Firúz [subsequently Firúz Sháh III. of Dihli], and Malik Fírúz was brother's son to Sultán Ghiyásuddín Tughluq Sháh, and son of the paternal uncle of Muhammad Sháh. Muhammad Shah, in the first year of his reign, made Malik Fírúz his Náib-Barbak. Now at this time, Hájí Ilyás, the foster-brother of 'Alí Mubárak, did something wicked and fled from Dihlí. Malik Fírúz asked 'Alí Mubárak what had become of Hájí Ilyás. 'Alí Mubárak went in search of him; and when he found no trace of him, he told Malik Fírúz that Hájí Ilyás had run away. Fírúz scolded him and told him to leave his presence. 'Alí

[•] The Riyáz has five months. Stewart places his death in 743; but all histories have 741.

[†] Dowson, Elliot's History, III, p. 304.

¹ See Ibn Batútah, p. 195.

[§] These facts are only mentioned by Shams i Siráj, who moreover places Fakhruddín's defeat and death immediately after Fírús Sháh's first invasion of Bengal in 754. This is clearly a few years too late.

Mubárak now went to Bengal. On his way, one night, he had a dream and saw the revered saint Jaláluddín Tabrizi, who said to him, "I will give thee the kingdom of Bengal; but thou wilt have to build me a vault." 'Alí Mubárak put the finger of acceptance on his eye, and asked where it was to be built. The saint replied, "In the town of Panduah at a place where thou wilt see thirty bricks one over another, and below them a fresh rose of a hundred petals."

'When 'Alí Mubárak arrived in Bengal, he entered the service of Qadar Khán, [the Imperial governor of Lak'hnautí] and received from him the command (bakhshigari) of the army. But when Fakhruddín revolted against Qadar Khán, 'Alí Mubárak killed his benefactor, and proclaimed himself king under the title of Sultán 'Aláuddín. He then made war upon Fakhruddín, and slew him "as a punishment for having killed his benefactor." Leaving thanahs in (the province of) Lak'hnautí, 'Aláuddín marched to subjugate other parts of Bengal. But from the time he had proclaimed himself king, the whirlpool of pleasure had made him forgetful of his promise to the Saint, when one night Jaláluddín again appeared to him and said, "O Sultán 'Aláuddín, thou art now king of Bengal, but me thou hast forgotten." The king next day at once searched for the bricks, and found them just as the saint had described There he built the vault, the ruins of which exist to this day.

'Now about this time Hájí Ilyás also arrived in Panduah. Sultán 'Aláuddin put him into prison, but after some time, at the request of his mother who had been Sultán 'Aláuddín's nurse, he set him at liberty, and allowed him to come to court. Háji Ilyás, in a short time, found means to gain over the army, killed 'Aláuddín with the help of the eunuch, and proclaimed himself king under the name of Shamsuddín Bhangrah.

'The reign of Sultan 'Alauddın lasted one year and five months.'

This extract is so far satisfactory, as it explains the relation between Firúz Sháh, 'Alí Mubirak, and Hájí Ilyás.

The evidence of coins, as in the case of the preceding king, gives 'Aláuddín 'Alí Sháh a longer reign than the histories. Mr. Thomas (Chronicles, p. 265) gives a coin of the year 742, and he adds that he has seen coins of 744, 745, 746. There is nothing strange in the name 'Alí Mubárak, which he thinks has arisen from "a strange jumble of Muhammadan writers, who endowed 'Alí Sháh with the surname of his adversary Mubárak Sháh;" for 'Alí Mubárak is as common a name as Mubárak 'Alí, and the histories say that this was 'Alí Sháh's name before accession.

From the fact that the coinage of Mubarak Shah is restricted to the Sunnargaon mint, and that of 'Ali Shah to Firuzabad (i. c. Panduah), we may conclude that the former held Eastern, and the latter Western Bengal.

But 'Ali Shah was vigorously opposed by Haji Ilyas, who struck coins

in Panduah, 'Alí Sháh's capital, in 740 and 744, and in uninterupted succession from 746 (probably the correct year when 'Alí Sháh was overcome by him) to 758.

III. Ikhtiya'ruddi'n Abul Muzaffar Gha'zi' Sha'h.

Fakhruddín Mubárak Sháh was succeeded in Eastern Bengal by Ikhti-yáruddín, who styles himself "son of the Sultán." We may, therefore, accept Mr. Thomas's hypothesis that he was the son of Mubárak Sháh. Coins are the only testimony on which the name of this king of Eastern Bengal has found a place in the list of kings. The figure of one of the coins given by Mr. Thomas, as also the specimen in the cabinet of the Bengal Asiatic Society, shew the year 753.*

IV. Shamsuddi'n Abul Muzaffar Ilya's Sha'h.

The relation of this king to 'Aláuddín 'Alí Sháh and Fírúz Sháh III. of Dihlí has been mentioned above. Having in 746 become master of Western Bengal, he established himself, in 753, in Sunnárgáðn (Thomas, p. 269), and thus founded a dynasty, which, with an interruption of about forty years in the beginning of the 9th century of the Hijrah, continued to rule over Bengal till 896 A.H.

Ilyás Sháh's successes in Eastern Bengal were followed by an attempt to extend the western boundaries of the kingdom, and according to the Riyáz he pushed as far as the Banáras district. In order to punish him, Fíráz Sháh, in 754, after marching through Tirhut and Púrniah, invaded Bengal and besieged Ekdálah. The defeat of Ilyás Sháh is almost humorously described by Ziyá i Baraní. But "the invasion only resulted in the confession of weakness, conveniently attributed to the periodical flooding of the country," and Fíráz Sháh withdrew,† appointing collectors, apparently

- Thomas, Chronicles, Pl. VI, fig. 9. The margin clearly gives & 1. A figure with any would be desirable, so that the reign of this king might be fixed from 751 to 753.
- † It is said in the Tabaqát i Akbari, under Ilyás Sháh, that Fírúz Sháh's expedition lasted from the 10th Shawwal, 754, till 11th Babi' I, 755. As the latter date corresponds to the 5th April 1353, it could only have been prospect of the rains, not the setting in of that season, that drove Fírúz Sháh back to Dihlí. The army, according to Barani, complained of mosquitos in the vicinity of Panduah.
- The 'Firazparabad,' mentioned by Stewart and quoted by Mr. Thomas (p. 264, note 2), where Firas Shah pitched his camp, should be 'Firaspar.' The Riyas says..." At a place where now Firaspar lies (bajds kih alyaum Firaspar abddast, not Firasparabad ast), Firas Shah pitched his camp, and starting from that place on horseback laid siege to the fort of Panduah. In the fort Sultan Shamsuddin had left his son, whilst he himself had retreated to Fort Ekdálah, which is very strong." The maps show several Firaspars round about Gaur; thus two are south of the fort of Gaur.

for the first time, in Tirhut, and was glad in subsequent years to exchange presents with Ilyas Shah.

As Hájí Ilyás is the legendary founder of Hájípúr, opposite Patna, we may assume that in northern Bihár the Ghandak formed the frontier; in south Bihár, however, the frontier could not have passed beyond Munger, because the inscriptions preserved in the town of Bihár (vide below) shew that in 732, 737, 753, 761, 792, and 799, the town of Bihár was under Dihlí governors.

Just as Mubárak Sháh and 'Alí Sháh are called in the histories by their first name, so is Ilyás Sháh also invariably called Sultán Shamsuddín. The name 'Ilyas Khaje,' which Stewart gives, is not to be found in historical works. Stewart also mentions 760 as the year in which Ilyás died, but the histories only mention that his reign lasted sixteen years and some months. In 758, he had for the third time sent ambassadors with presents to Dihlí, and Fíruz returned the compliment by sending him horses; but the Dihlí ambassadors on reaching Bihár heard that Ilyás had in the meantime died. The latest of Mr. Thomas's coins of Ilyás Sháh also bear the year 758.

Ilyás Sháh is nicknamed 'Bhangrah,' a corruption, it seems, of the Hindústání bhangérá, 'a seller, or eater, of the drug bháng (hemp).' Firishtah says that he does not know the origin of the word; but Ziyá i Baraní evidently knew more about it; for he says, rejoicing in his joke,—"And the well known Bengal Páiks, who for years had borne the name of 'the Bengal Ancients' or 'the Dead,' had taken a quid from Ilyás the Bháng-eater, in order to shew that they were ready to sacrifice their lives for him; and standing in front of the train of that wild maniac, together with the mouldy-looking Bangálí Rájahs, they bravely threw about their arms and legs; but as soon as the battle commenced, they put from fear their fibgers into their mouths, gave up standing to attention, threw away swords and arrows, rubbed their foreheads on the ground, and were consumed by the swords of the enemies." A graphic description, by the way, of the Bengal Military Police in 1353, A. D.

No inscriptions have hitherto turned up that mention Ilyás Sháh; nor does the author of the Riyáz, who had a good personal knowledge of the ruins of Gaur and Panduah, speak of any buildings erected by him. He only says—'It is said that Sultán Shamsuddín made in Bengal a reservoir in imitation of Hauz i Shamsi at Dihlí.'

^{*} Reinaud, however, quoted by Marsden (p. 566, note) mentions two Sunnarging coins of 754 and 760. The MS. of the Riyáz belonging to the Asiatic Society of. Bengal mentions 758 as the year in which the last ambassadors left for Dihlí; Stewart has 759; and the Tabaqát and Firishtah, who copies from it, have 'in the end of 759.' The earliest coin of Sikandar figured by Mr Thomas (Journal, As. Soc. of Bengal, 1867, Part I, p. 63, and Pl. II, No. 12) belongs to 761.

Regarding the coinage of Ilyás Sháh, vide Thomas, Initial Coinage of Bengal, Journal, As. Soc. Bengal, 1867, pp. 57, 58.

V. Abul Muja'hid Sikandar Sha'h.

Ilyás Sháh was succeeded by his eldest son Sikandar Sháh. The beginning of his reign was marked by a second attempt* made by Fírúz Sháh to annex Bengal; but as in the first, Ekdálah held out, and Fírúz returned to Dihli, and never again interfered in Bengal matters.

'In 766,' says the Riyáz,† 'Sikandar commenced to build the Adínah [i. e. Friday] Mosque; but he had not finished it when he died, and the building remained half completed, and now-a-days parts of the edifico may be seen in the jungle near Panduah, about a kos from it. I have seen it myself: it is, indeed, a fine mosque and must have cost a great deal of money. May Sikandar's efforts be thankfully remembered!'

According to the same author, Sikandar Sháh died after a reign of nine years and some months—a statement also given in the Tabaqát—of wounds which he had received 'on the field of Goálpárah,' tighting with his favourite son Ghiyás, whom the machinations of a jealous step-mother had driven into rebellion.1

'Sikandar was the contemporary of the revered saint 'Alául Haq.'

Several inscriptions belonging to Sikandar's reign have been found. One of the year 765, from Dinájpúr, was published by me in the Journal for 1872, p. 105. I remarked there on the beauty of its characters; but the inscriptions inside and outside the Adinah Mosque, rubbings of which the Society owes to General Cunningham and Mr. W. L. Heeley, are the finest that I have seen. The characters are beautiful, and the rubbings have created sensation wherever I have shewn them. The inscription inside is 13½ ft. long and 1½ ft. broad, but contains only verses from the Qorán [Sur. IX, 18, 19], on the top in Kufic and below in (what people call now-a-days in India)

^{*} In 760, according to the Tabaqát and the Riyáz; Stowart has 761. Rogarding Fírúz Sháh's desire to reinstate Zafar Khán, Mubarak Sháh's son-in-law, in the government of Sunnárgáon, the cause that led to the expedition, vide Dowson, Elliot's History of India, III, 304, ff.

[†] Stewart has 763.

[‡] Ghiyáz marched with a large army from Sunnárgáon, and pitched his camp at Sunnárgarhí. Stewart has Sunnárkof. From the other side, his father issued forth with a terror-inspiring army, and the next day, on the field of Goálpárah, both parties engaged in deadly strife. The whole story is only to be found in the Riyás.

The Gotiperah meant here is, no doubt, the village quite close to Panduah, S. W. of it. I have not identified Sunnérgaphi.

[§] It was written by one Ghiyás. General Cunningham is inclined to think that the Ghiyás is Sikandar's son.

Tughrá characters. The stone outside measures 4 ft. 9 in. by 10 in., and its letters are just as beautiful.

No. 8. The Sikandar Shih Inscription, Adinah Mosque, Hazrat Panduah,
A. H. 770, (vide Pl. V, No. 3).*

آمبر ببناء العمارة هذا المسجد الجا ابا (؟) في الدولة السلطان الاعظم اعلم اعدل اكرم اكمل السلاطين العرب و العجم الواثق بتائيد الرحمن ابو المجاهد سكندر شاء سلطان بن الياس شاء السلطان خلد خلافته الى يوم الموعود كتبه في التاريخ ست رجب سنة سبعين و سبعماية اا

This......mosque was ordered to be built in the roign of the great king, the wisest, the justest, the most liberal of the kings of Arabia and Porsia, who trusts in the assistance of the Merciful, Abul Mujáhid Sikandar Sháh, the king, son of Ilyás Sháh, the king,—may his roign be perpetuated till the day of promise!

He wrote it on the 6th Rajab of the year 770. [14th February, 1369.]

Neither inscriptions nor coins give Sikandar Sháh a full julús name; he only has a kunyah, Abul Mujáhid. Perhaps it would be going too far in speculations, if I were to say that Ilyás naturally called his son Sikandar; but a Muhammadan, on hearing the name of Ilyás, will immediately think of the áb i hayát, 'the water of life'; and as Sikandar is the legendary successor of Ilyás (the Prophet Elias) in search of the precious commodity, the name of the father may have suggested that of the son.

As stated above, the histories assign Sikandar Sháh a reign of nine years and some months. Stewart says that he died in 769, a year obtained by adding nine years and a fraction to 760, which he assumes to have been the year in which Ilyás Sháh died. The above Panduah inscription extends Sikandar's reign to the latter half of 770, and the coins figured by Mr. Thomas in his 'Initial Coinage' (J. A. S. B., 1867, Pl. II, Nos. 12, 14, and 13) give the dates 761, 782, and 783. But Mr. Thomas also states that among the large number of Sikandarsháhís that passed through his hands, he found coins of almost every year between 750 and 792, with the exception of the years 755, 762, 767, 768, 769, 774, 775, 777, and 778. It thus becomes clear that Sikandar Sháh struck coins as prince. Mr. Thomas also quotes A'zam Sháhí coins of 772, 775, 776, the years when Sikandar's coinage is most interrupted, and again from 790 to 799. Further, we have to remember that the poet Háfiz sent the well known ghazal

* I have elsewhere remarked on the numerous grammatical mistakes in Bengal Arabic Inscriptions. They consist chiefly in wrong articles, mistakes in gender, in oblique cases, and in wrong constructions of the Arabic numerals. In order not to disfigure the text, I shall no more indicate such errors by a (sic).

to Ghiyásuddín A'zam Sháh, 'king' of Bengal; and as Háfiz died in 791 (خاك مصلي being the date of his death), the ghazal must have been sent to Bengal during Sikandar Sháh's lifetime. The fact that A'zam Sháh's early coins (of A. H. 772) were struck in Mu'azzamábád (vide above), agrees with the statement of the Riyáz that he rebelled in Eastern Bengal, where he remained "nominally subordinate or covertly resistant to paternal authority."*

VI. Ghiya'suddi'n Abul Muzaffar A'zam Sha'h.

The only fact given in the Riyóz and omitted by Stewart is that "A'zam "Sháh was treacherously murdered (ba-daghá kushtah) by Rájah Káns "after a reign of seven years and some months,† or, as I have seen in a "little book, after a reign of sixteen years, five months, and three days."

The coins of this king, as mentioned before, go to 799; the latest figured by Mr. Thomas (Initial Coinage of Bengal, Pl. II, No. 15) is of 795.‡ No inscription of this and the following two kings have been found.

* It is also curious that in the inscription of 777, published by me in this Journal for 1870, p. 292, no king is mentioned, as if it had been doubtful who the real king was.

In order to remove all doubts regarding a confusion of was and in the reading of Sikandar's and A'zam Sháh's coins, a few clear drawings of Sikandar Sháhís struck between 783 and 792, and of A'zam Sháhís, struck in 772, 776, 776, would be required. A'zam Sháh's reign, according to the common statement, lasted 7 years, which we certainly get when we subtract 792 (the latest year cited by Mr. Thomas for Sikandar Sháh) from 799 (the latest year cited for A'zam Shah); but if we take the second statement, given in the Riyáz, regarding the length of A'zam Sháh's reign, viz. 16 years, 5 months, and 3 days, and subtract it from 799, we get 788, the year of Mr. Thomas's latest figured coin.

† I. e., according to the wrong chrohology of the Tabaqat and the Riyas, in 775.

† I may here suggest a few unimportant alterations in Mr. Thomas's readings of A'sam Sháh's coins ('Initial Coinage,' J. A. S. B., 1867, pp. 68 to 70). First,

is to be corrected to عون الأصلام. Again, the mysterious کین (loc. cit,

p. 68) is nothing but بعین yamin. Lastly the reverse of coin No. 38 (loc. cit.,

p. 70), as I see from a specimen in the Society's Coin Cabinet, is

May God render his power everlasting, and may God perpetuate his reign,—abbada allahu, not the name 'Abdullah,—which removes from the mint officials the charge of ignorance. It was only Akbar who, in his hatred of everything that was Arabic,

recommended the substitution of Alif for 'Ain, and g for , &c.

In the reverse of the Sikandar Sháhí (loc. cit., p. 64, No. 28), as I also see from a coin in the possession of the Society, there is a wrong Alif before ما and a g (wow) is omitted before Algáhóru,—'Who renders assistance to the religion of God, and who is victorious over the enemies of God.' This cancels the footnote.

VII. Saifuddi'n Abul Muja'hid Hamzah Sha'h, son of A'sam Sha'h.

The histories give him the epithet of Sultán ussalátín, and praise him for his virtues. Firishtah says:—"And the Rájahs of the country did not draw their heads out of the yoke of obedience and practised no neglect and delay in paying taxes."

According to the Tabaqát, he reigned ten years. But the author of the Riyáz saw "in the little book," that the reign of this king was 3 years, 7 months, and 5 days, which would bring his reign to 802, or 803, A. H.

Marsden has published a coin of this king, without, however, giving the Royal name (Numism., Pl. XXXVII, No. DCCLIV). It follows in appearance the coins of Sikandar Shah and A'zam Shah; the margin contains 'Fírúzábád,' but no year. The specimen in the cabinet of the Asiatic Society is of very rude manufacture, and has most clumsy letters, especially on the reverse.

Vide Pl. VII, No 1. Silver. Weight, 162 505 grains. A. H. (80)4. (Asiatic Society of Bengal, one specimen.) Rare. Circular areas.

OBVERSE الرحمن سيف الدنيا والدين الوالمجاهد حمزة شاة الرحمن سيف الدنيا والدين الوالمجاهد حمزة شاة السلطان بن اعظمشاة السلطان

Assisted by the assistance of the Merciful, Saifuddunyá waddín Abul Mujáhid Hamzah Shah, son of A'zam Sháh, the king. The helper of Islám and the Mushins * * year * * 4

VIII. Shamsuddi'n ? ?, son of Saifuddi'n Hamzah Sha'h.

The Tubaqát says that this king followed the path of his father, and died after a quiet reign of three years and a few months. Firishtah states that as the king was young and deficient in intellect, an infidel of the name of Káns, who was an Amír of the court, obtained great power and influence, and usurped the executive and the collection of taxes. The Riyaz has the the following: "After enjoying himself for some time, he died, in 788, from an illness, or through the foul play of Rájah Káns, who at that time was very powerful. And some writers have asserted that this Shamsuddin was no son of the Sultún ussalátín, but an adopted son (mutabanní), and that his name was Shihábuddín. Anyhow, he reigned 3 years, 4 months, and 6 days. It is clear that Rájah Káns, who was zamíndár of Bhatúriah, rebelled against him, killed him, and usurped the throne."

THE SAINTS OF GAUR AND HAZRAT PANDUAH.

Before proceeding in my account of the kings of Bengal, it may be convenient here to collect the information which we possess regarding the

^{*} I. s., according to the erroncous chronology, he would have died in 785.

Muhammadan saints of Gaur and Panduah. Their names often occur in Bengal History, while their dargáhs, as elsewhere, are the natural depositories of inscriptions.

The principal personages of saintly renown are Shaikh Jaláluddín Tabrízí, Shaikh Akhí Sirájuddín 'Usmán, Shaikh 'Aláulhaq, and Núr Qutb 'Alam.* All larger works on Muhammadan Saints contain biographical notices of them.

1. Shaikh Jaláluddín Tabrízí.

He was a pupil of Abú Sa'íd Tabrízí and of the renowned Shaikh Shiháb-uddín Suhrawardí. He accompanied the latter on his pilgrimages to Makkah, and used to carry on his head a small oven with the hot pots in which his master kept his food. Numerous miracles are ascribed to him. Among others, he converted, with one look, at Badáon a Hindú milkman to Islám. Though several times charged with immoral practices, he defeated his accusers. When he went to Bengal, he commenced to destroy idols; in fact, his vault occupies the site of an idol temple. He kept a langarkhánah, where he housed and fed beggars and travellers. He died in 642 A. H., or A. D. 1244. The place where he died does not seem to be accurately known. The Mutawallís of the tomb near Gaur say that he died in Aurangábád (the old K'harkí), and that his shrine in Bengal† is a mere jawab, or imitation-vault; but the Kín i Akbarí (IVth book) says that he was buried at Bandar Díú Mahall.‡ Vide below under Yúsuf Sháh.

Shaikh Akhí Sirájuddín 'Usmán.

Siráj came as a boy to Nizámuddín Auliá of Dihlí, who handed him over to Fakhruddín Zarrádí to teach. In course of time, he became very learned, and was told to go to Bengal, where he died in 758, A. H., or 1357, A. D. The Haft Iqlim says that Nizám called him 'the mirror of Hindústán,' and that he only received, when advanced in age, proper instruction from Fakhruddín. After Nizám's death, he went to Lak'hnautí, and all the king became his pupils.

For the inscriptions at his tomb, vide below under Husain Sháh.

- Besides these, the Riyáz mentions a Shaikh Rájá Bayábání (died in 754, when Fírúz besieged Ilyás Sháh). Shaikh Hamíd of Nágor, one of Núr Qutb 'Alam's teachers, belongs to Nágor in Jodhpúr, not to Nágor in Bírbhúm, as Stewart says.
- † As most Dargáhs in Bengal, Sháh Jalál's tomb is rich. Its lands lic chiefly in Bardwán District, at Bohát, near Maumárí, a station on the E. I. Bailway. There is a Madrasah and a Sarái in Bohát.

The oven is still shown at the Gaur shrine, and "till three generations back, it cooked rice without fuel."

¹ I. e. either the Maldives, or Din in Gujaret. Vide Dowson, IV, 96, note.

8. Shaikh 'Aláuddín 'Alá-ulhag.

'Alá-ulhag was the son of Shaikh As'ad of Lahor, and one of the spiritual successors of Shaikh Akhí Sirájuddín 'Usmán. According to the Ma'árij-ulwiláyat, he was a true Quraishí Háshimí, and traced his descent from Khálid bin Walid. He was at first exceedingly proud of his origin, wealth, and knowledge, so much so, that Shaikh Akhi complainingly told Nizámuddín Auliá that he was no match for 'Alá-ulhag. But Nizám told him not to mind it, as 'Alá would in time become his (Akhí's) pupil. It seems that 'Alá in his pride called himself Ganj i Nabát," and when Nizam heard this, he cursed him, and said, "May God strike him dumb!" The curse instantly took effect; nor was 'Ala-ulhaq's tongue loosed till he became the humble pupil of Shaikh Akhí. As Shaikh Akhí travelled a great deal on horseback, 'Alá-ulhaq accompanied him walking barefoot and carrying his master's pots filled with hot food on his head, till he became quite bald. Nor did he feel concerned when Shaikh Akhi, with a view of humbling him, passed on his journey the houses of his brothers, who were all Amirs and rich men.

Once some travelling faqirs came to 'Alá-ulhaq's cell. One of them had a cat with him;† but whilst in 'Alá's house, the cat was lost. The owner asked the saint to 'make' him a new cat; but when 'Alá said that he did not know from what to make one, he replied, "What do I care from what you make it, make it out of the horn of a stag, if you like." 'Alá was annoyed and said, "You shall feel the horns." Thereupon another of the faqirs, in order to vex the saint, said, "Well, can I make a cat from my testicles?" and 'Alá replied, "There you shall feel it." When the faqirs had left the house, the former was killed by an ox, and the second got an attack of orchitis, of which he died.

'Alá-ulhaq spent large sums in freding pupils, beggars, and wanderers. But the king of the land got envious, because the public treasury even could not have borne such a heavy expenditure, and he drove the saint to Sunnárgáon. He stayed there for two years, and gave his servants orders to spend twice as much as before. And yet, he only possessed two gardens, the income from which was eight thousand silver tankahs per annum; but as he gave a beggar the land as a present, all money must have been supplied him from the unseen world.

Fariduddín 'Attár, the great saint of Pák Patan (Ajodhan) in the Panjáb has the title of Ganj i Shakar, 'store of sugar.' But shakar may be unrefined, whilst mabát is applied to the best refined sugar. 'Alá-ulhaq, therefore, placed himself above Farid.

[†] What the dog is to Europeans, is the cat to Indians. To kill or lose a cast is most unlucky.

'Alá-ulhaq died on the 1st Rajab, 800, or 20th March, 1898, and his tomb is at Hazrat Panduah.

4. Shaikh Nuruddin Núr Quib 'Alam.

He is the son and spiritual successor of 'Alá-ulhaq. In order early to practise the virtue of humility, he washed the clothes of beggars and wanderers, and kept the water constantly hot for ceremonial ablutions; nay, he even swept the cell of his father and cleaned the privies attached to the house. One day, whilst thus engaged, his pure body was polluted, and his father allowed him to proceed to other work, as woodcutting. He refused the invitation of his worldly brother A'zam Khán, who was the Vazir at the court of Muhammad Tughluq.*

Quito 'Alam died in 851, or A. D. 1447, and lies buried at Panquah. The words shams ul hidáyat, 'lamp of guidance,' are the táríkh of his death. He was succeeded by his sons Ruf'atuddín and Shaikh Anwar.

IX. Ra'jah Ka'ns.

We saw above that Shamsuddín (II.)—a king whose existence and royal titles have not yet been verified by medallic or mural evidence—was dethroned by Rájah Káns. This Rájah, at the present stage of research, belongs to legends and traditions rather than to authenticated history, there being, little else known of him besides the fact that through him the succession of kings of the house of Ilyás Sháh, which had successfully ruled over Bengal for more than fifty years, was broken, and that his son became a Muhammadan.

The remark of the Riyáz regarding Shamsuddín and the probability that he did not belong to the old dynasty, but was an adopted son and was called Shihábuddín, receives a particular importance from the following coins of a new king, whom I shall now assign, for the first time, I believe, a place in the list of the kings of Bengal. Their manner of execution, which follows closely on that of the coins of preceding kings, and the mint towns mentioned proclaim them to be Bengal coins. The name of the new king is—

Shiha'buddi'n Abul Muzaffar Ba'yazi'd Sha'h.

His coins do not mention the name of his father, and the absence of the usual phrase ion ussulfan, 'son of the king,' indicates that he was either a usurper, in which case 'Báyazíd' might represent the Muhammadan name of Rájah Káns after conversion, or a puppet king, in whose name Rájah Káns reigned and coined in the 'Dárul Islám' of Bengal.

If we take the first alternative, we have against it the clear statement of the historians that Káns remained a Hindú, and also the circumstance

This is rather early, considering that 752 is Tughluq's last year.

1878.7

that his son does not mention the name of his father on his coins, which he would scarcely have omitted, if Káns had turned Muhammadan. And if we look upon this Báyazíd Sháh as a successful rival of Rájah Káns, we have history and legends against us. Hence the theory of a puppet king—a bendmi transaction—is perhaps the least objectionable.

1. Vide Pl. VIII, No. 2. Silver. Weight, 168 94 grains. A.H. 812.

Circular areas. (Asiatic Society of Bengal, one specimen.)

المؤيدبقائيد الرحمن شهاب الدنيا و الدين ابو المظفر بايزيد شاة -OBVERSE. المطلق المحمد الملطان

Margin .- Cut away.

ناصر امير البومنين غوث الاسلام و المسلمين خلد ملكة فعرب العربين غوث الاسلام و المسلمين خلد ملكة هنه Margin. منه المرب هذه السكة

Assisted by the assistance of the Merciful, Shihabuddunya waddin Abul Muzaffar Bayazid Shah, the king.

The helper of the Commander of the Faithful, the aid of Islâm and the Muslims, may God perpetuate his reign! This com was struck *** * year 812.

2 Vide Pl. VIII, No. 3.* New variety. Silver. Weight, 165.76 grains. Fírúzábád, A. II. 816. (Asiatic Society of Bengal, two specimens.) Rare. The obverse has sixteen convex scollops, and the reverse eight concave ones.

OBVERSE.—As in No. 1.

Margin .- Cut away.

ناصر امير المومذين غوث الاسلام و المسلمين....REVERSE

ا بو بكر) ضرب (عمر) فيروز (عثمان) آباد سنه (علي) In the Margin.—Aly (إلى علي) strike Margin.—(Abú Bakr) struck at ('Umar) Firúz-('Usmán) ábád in the year ('Alí) 816.

Rájah Káns has been identified by Mr. E. V. Westmacott† with Ganesh, Rájah of 'Dynwaj,' or Dinajpúr. The Riyaz, who appears to have compiled his chapter on this usurper from local traditions, calls him 'Rājah of Bhatúriah.' Whether this name is an ancient one, I cannot say; it does not occur in the Aín, nor have I seen it before the time of Rennell's Atlas (1778), in which the name of Bhatúriah is given to a large District east of Máldah, bounded in the west by the Mahanandá River and the Púrna-

It is also curious that a Parganah near Dináppir (south-west of it) has the name of 'Bajitpūr,' a well known Bangáli corruption of Bāyazīd pūr, which at ones reminds us of Báyazīd Shāh. We may attach some significance to this, as the name is evidently old; for the name of this very parganah occurs in the Kin i Akbari (my text edition, p. 403, in Sirkār Panjrah).

^{*} In the figure of this coin, there is a wrong stroke between the A and I in the year.

[†] Vide Calcutta Review, No CX, October, 1872. Col. Dalton suggests a comparison of the name 'Káns' with 'Kons,' or 'Konch,' the same as Koch (Koch Bihár), Koch is often pronounced with a nasal twang, as if it were spelt Koñs.

bhaba its tributary, in the south by the left bank of the Ganges, in the east by the Karataya, and in the north by Dinájpúr and G'horág'hát. Bhatúriah, therefore, is the district to both sides of the Atrai River.

The Tabaqát i Afbari merely states the fact of Káns's usurpation, and assigns him a reign of seven years. Firishtah, who has been followed by Stewart, says that, "though no Muhammadan, he mixed with them and loved them, so much so that some Muhammadans testified to his conversion, and claimed for him a Muhammadan burial. After a vigorous reign of seven years, he went to the world of annihilation, and was succeeded by his son, who had the honor of being converted to Islám."

The Riyáz represents the views of the opponents of the Rájah, and gives the following:—

'When Sultan Shamsuddin died, Rajah Kans, a Hindú zamindár, seized the whole kingdom of Bengal, and sat proudly on the throne. Oppression and bloodshed followed; he tried to kill all Muhammadans, and had many learned men murdered. In fact, his object was to drive Islam from his kingdom. One day, people say, Shaikh Badr ul Islam, son of Shaikh Mu'inuddin 'Abbas, went to the wicked tyrant, but did not greet him. When the Rajah asked him why he had not saluted him, he replied, "Learned men are not supposed to greet infidels, especially an infidel tyrant, who like thee sheds the blood of Muhammadans." The unclean heretic was silenced, he winced under the reply, and thought of nothing else but to kill the Shaikh. He, therefore, called him one day to a room, the door of which was very low and narrow. But the Shaikh saw through the plan,* and put his foot first over the threshold, and then entered without bending his head. This annoyed the Rajah so much, that he gave orders to take him to the path of his brethren. The Shaikh was at once executed. All the remaining learned men, on the same day, were put on board a ship and were drowned in the middle of the river.

'The usurpation of this infidel and the slaughter of Muhammadans drove at last the Saint Núr Qutb ul 'Alam to despair, and he wrote a letter to Sultán Ibráhim i Sharqí (of Jaunpúr), who at that time had extended his kingdom to the [Eastern] frontier of Bihár,† complaining of the injustice done to Islám and the Muslims, and asking the king to march against the infidel. Ibráhím received the letter with due humility, and consulted with Qází

^{*} The Rájah evidently wished the Shaikh to come to him in a stooping position, which might be looked upon as a 'salám'.

[†] The Janupur kingdom was founded in 796, and Ibrahim Sharqi, the first titular Sultan, reigned from 804 to 844. The faulty chronology of the Tabaqat, Firiahtah, and Stewart, makes Rajah Kans die in 794. The story of the Riyas, therefore, agrees very well with the testimony of coins; but it is strange that the author of the Riyas did not see the anachronism.

Shihabuddin Jaunpuri, the chief of the learned of the age, who was allowed at court to sit on a silver chair. The Qazi represented the worldly and religious advantages that would flow from a war with the infidel on the one hand, and from a visit to the great saint, on the other. The king, therefore, collected a large army, invaded Bengal, and pitched his camp at Sarái Fírúzpúr. Rájah Káns now applied to Qutb ul 'Alam, begged to be forgiven, and asked him to intercede on his behalf with the king of Jaunpur. The saint replied that at the request of an infidel he could not bid a Muhammadan king stop; in fact, he had himself invited the enemy to come. The Rájah placed his head on the feet of the saint, and said, he was willing to perform anything he ordered him to do, whereupon Qutb ul 'Alam told him that he would not interfere until he was converted to Islam. Rájah placed the finger of acceptance upon his eye; but the wife of the infidel led him back to perdition, and he evaded conversion. But he took his boy, who was twelve years old and had the name of Jadu, to the saint and said, "I have got old and wish to renounce the world; make this boy a Muhammadan and give him the kingdom of Bengal." Qutb ul 'Alam, thereupon, put some pán which he was chewing, into Jadá's* mouth, taught him the creed, and thus made him a Muhammadan, giving him the name of Jalaluddin. According to the Rajah's wish, he also sent a proclamation through the town, ordering the people to read the Friday prayer in the name of the new king. The blessed law of the prophet was thus carried out with new vigour. Qutb ul 'Alam now went to king Ibráhím, and asked him to return. The king looked angrily at Qází Shihábuddín, who said to Qutb ul 'Alam, " At your request the king has come here, and now you come to him as ambassador to implore his mercy. What shall men think of this?" The saint replied, "When I called you, a tyrant oppressed the faithful: but now, in consequence of your approach, the new ruler has become a Muhammadan; fight with infidels, not with a king that belongs to the Faith." This silenced the Qazi; but as the king still looked angry, the Qází had the boldness to enter into a scientific discussion with the saint. After many questions and answers, Qutb said, "To look on the poor with contempt or entangle them in examinations, brings no man prosperity. Your miserable end is at hand." He then looked even at the Sultan with expressions of anger. Ibrahim now got vexed, and returned with a sorry heart to Jaunpur. It is said that not long after, Sultan Ibrahim aud Qazi Shihábuddin died.

'When Rájah Káns heard that Sultán Ibráhím was dead, he deposed Jaláluddín, took again the reins of the government into his own hands, and ruled according to his false tenets. He made several hollow cows of gold, threw Jalál into the mouth of one, and pulled him out behind; the gold,

^{*} As saints do with their pupils, or in order to break the boy's caste.

was then distributed among the Brahmans. He hoped that the boy would thus return to his old faith. But as Jalál had been converted to Islám by a saint like Qutb ul 'Alam, he remained faithful to his new belief, and the talk of the infidels made no impression upon him.

'Rájah Káns now again commenced to persecute the Muhammandans. When the measure of his cruelties was full, Shaikh Anwar, son of Qutb ul-'Alam, said one day to his father, "It is a matter of regret that, with you as guardian saint, the Muhammadans have so much to suffer at the hand of this infidel." The saint was just at his devotions, and angry at the interruption, he exclaimed, "The misery will not cease till thy blood is shed." Anwar knew that whatever his father said, was sure to come true; he, therefore, replied that he was a willing martyr * * *. The oppression of Rájah Káns reached the climax, when he imprisoned Shaikh Anwar and his brother's son Shaikh Zahid. But as he dared not kill them, he banished them to Sunnárgaon, in the hope that they would confess where Qutb ul 'Alam had buried his money and that of his father. But even though they were sent to Sunnargaon, and were much threatened, no money was found, because none had ever been buried, and Shaikh Anwar was ordered to be killed. Before his execution, he said that at such and such a place they would find a large pot. People dug and found a large vessel with only one gold coin in it. On being asked what had become of the other money, Anwar replied, "It seems to have been stolen." Anwar. no doubt, said so by inspiration from the unseen world.

'It is said that on the very day on which Shaikh Anwar died, Rajah Káns went from his palace to the infernal regions. But according to the statement of some, he was killed by his son Jaláluddín, who, though in prison, had won over the officers. The oppressive rule of this monster had lasted seven years.'

X. Jala'luddi'n Abul Muzaffar Muhammad Sha'h.

According to the histories, he is the son* of Rájah Káns. His real name is given in the Riyáz as 'Jadú,' and by Firishtah as 'Jatmall' or 'Jaimall'—the MSS. differ. There is a place Jatmall púr, a little east of Dínájpúr, and we may assume the first name to be correct. As the coins of Báyazíd Sháh go up to 816, and the coins of Muhammad Sháh commence with 818, the latter year, or 817, must be the beginning of his reign; and if he reigned for seventeen years, as stated in the histories, his reign may have lasted from 818 to 835, which agrees with the year on Maraden's coin

Stewart supposes that he was the eldest son of the Réjah by a Muhammadan oquonbine. According to the Tabaqát and Firishtah, he reigned seventeen years, and died in \$12 A.H. Stewart says, eighteen years.

of his successor Ahmad Sháh (886). General Cunningham tells me that the Bodleian Library at Oxford has a specimen of 831.

1. Vide Pl. VIII, No. 4, and Marsden, Numism., Pl. XXXVII, No. DCCLXV. Silver. Weight, 166-89 grains. Mint town?. A.H 818. (As. Soc. Bengal, one specimen.)

Obverse area, bounded by sixteen convex scollops; reverse area, a four-leafed shamrock.

OBVERSE — الدين ابو المظفر صحمد شاة السلطان Margin, none.

ناصر الاسلام و المسلمين خلد ملكه....REVERSE

ضرب هدة السكة في مهده سنة ١٨٨ Margin.-- ١٨٨

Jaliluddunyá waddín Abul Muzaffar Muhammad Sháh, the king. The helper of Islám and of the Muslims,—may his roign be perpetuated! This coin was struck in ... in the year 818.

Marsden gives this coin as dated 823, but his figure does not shew that year.

2. Vide Pl VIII, No 5. New variety. Silver. Weight, 165:695 grains. A. H. 818. (As. Soc. Bengal, one specimen). Obverse area as in No. 1; reverse, eight concave scollops.

OBVERSE - السلطان العادل جلال الدنيا والدس ابوالعظفر محمدشاة السلطان العادل جلال الدنيا والدس ابوالعظفر محمدشاة السلطان العادل جلال

ماصر امير المومدين غوث الاسالام و المسلمين -- REVERSE

The just king Jaláluddunyá waddín Abul Muzaffar Muhammad Sháh, the helper of the Commander of the Faithful, the aid of Islám and the Muslims. (Abú Bakr) struck ('Umai) in the year ('Usmán) eighteen ('Alí) eight hundred [818, A. H.].

3. Vide Pl. VIII, No. 6. Silver. Weight, 155'725 grains. Sunnárgáon (?), A. H. 821. (As. Soc. Bengal, one specimen.) Obverse area, as in No. 1; reverse area, a square inscribed in a circle.

OBVERSE and REVERSE, as in No. 1.

During the time of Muhammad Shah, says the Riyaz, the town of Panduah became so flourishing, that it cannot be sufficiently described. The king also built a mosque, a reservoir, the Jalali Tank, and a Sarai in Gaur; in fact, Gaur also was again during his reign occupied. He reigned for seventeen years. In the year 812 [822], he made the Palace of Gaur his residence. A large dome with his tomb still exists in Panduah, and the tombs of his wife and his son are at the side of his in the same vaults.

XI. Shamsuddi'n Abul Muja'hid Ahmad Sha'h.

Marsden (Numismata, Pl. ***XXVII, No. DCCLXXIV) has published a silver coin of this king, whom the histories call the son of Muhammad Sháh. The coin bears the clear date 836 A.H. (1432-33, A.D.), and differs from the preceeding Bengal coins by having the Kalimah on one side.* The Tabaqat merely states that he reigned for sixteen† years, and died in 830 A. H, whilst Firishtah adds that he was a good and liberal king. The Riyáz gives him a different character. 'As Ahmad Sháh was of rough disposition, tyrannical, and blood thirsty, he shed the blood of innocent people, and tore open the bodies of pregnant women. When his cruelty had risen high, and great and small were in despair, Shádí Khán and Naçir Khán, two of his slaves, whom he had raised to the rank of Amirs, made a conspiracy and killed him. This took place in 830, after Ahmad Sháh had reigned sixteen, or, as some say, eighteen, years.'

- 'Shádi Khán now desired to get rid of Náçir Khán; but Náçir Khán outwitted him, killed him, and issued orders as king. The Amírs and Maliks, however, refused to obey him, and murdered him, after seven days, or, as some say, after twelve hours.'
- With Ahmad Shah ends the dynasty of Rájah Káns. Taking the year 817, the beginning of Muhammad Sháh's reign, as a well attested starting point, and assuming the duration of each reign as given in the histories to be correct, we would get—

 Rájah Káns
(Báyazíd Sháh)
 817 — 7, or 810 to 817.
 Coins of 812 and 816.

 Muhammad Sháh,
Ahmad Sháh,
 817 + 17, or 817 to 834.
 Coins of 818, 821, 823, 831.

 Coins of 818, 821, 823, 831.
 Coins of 836.

Now above we saw that the last ascertained year for Hamzah Sháh's reign is 804. If we then allow, on the testimony of all histories, above three years to Shamsuddín, son, of Saifuddín, we would be brought to the year 808, the commencement of the usurpation of Rájah Káns, and the reckoning, according to the data which we at present possess, is on the whole satisfactory.

The length of Ahmad Sháh's reign only is open to doubt; for if his reign be extended to 850, we are forced to assume that for the greater part of his rule he was vigorously and successfully opposed by Náciruddín Mahmúd, whose coinage, as will be seen from the following, goes back at least to 846 A. H.

[•] The reading of the obverse is—
السلطان الاعظم شمس الدنيا و الدين ابو المجاهد المدد شاء بن محمد شاء السلطان
† Stewart has eighteen.

RESTORATION OF THE ILYA'S SHA'H DYNASTY.

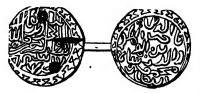
XII. Ne'siruddi'n Abul Muzaffar Mahmu'd Sha'h (I).

The histories agree in describing him as a descendant of Ilyás Sháh. He seems to have been supported by the old party who were tired of Ahmad Sháh; old families are said to have gathered round him; and Gaur, the old capital, was rebuilt by him. The wars between Jaunpúr and Dihlí, as Firishtah correctly observes, gave Bengal rest, and Mahmúd Sháh, according to the histories, reigned in peace for thirty-two years, or according to some "not more than twenty-seven years," and died in A. H. 862.

In the histories, he is called by his first name Naçir Shah, instead of Mahmud Shah. Bengal history presents several examples of similar inversions, if the retention of the familiar name of the king can be called so.

The chronology of Mahmúd Sháh's reign has been considerably cleared up by a coin in the possession of Col H. Hyde, the President of our Society, and by the inscriptions received from General Cunningham and Dr. Wise. The dates now ascertained are 846; 861; 20th Sha'bán, 863; 28th' Zil Hajjah, 863. Again, the oldest inscription of Bárbak Sháh, discovered by Mr. E. V. Westmacott, is dated Cafar, 865. We are, therefore, certain that Mahmúd Sháh must have reigned at least till the beginning of 864. But if the second statement of the histories regarding the length of his reign (27 years) be correct, we would get the year 836 as the first year of his reign, the very year in which Marsden's Ahmad Sháhí was struck. This would make Mahmúd Sháh an opposition king for the whole length of Ahmad Shíh's reign, which the histories say was not the case. We require, therefore, more evidence to fix the beginning of Mahmúd's reign.

1. Coin of Mahmud Shoh. New variety. Silver. Weight, 165-08 grains. (Col. H. Hyde.) A. H. 816. No mint-town. The margin contains little crosses.



المؤيد بعاتيد الرحمن حجت خليفة الله[في الزمان؟] ضرب سنه APY من بعاتيد الرحمن حجت خليفة الله[في الزمان؟] المؤيد بعاتيد الموال و الدين ابو المظفر صحمود شالا السلطان المؤلف

He who is assisted by the assistance of God, the evidence of the Khalifah of God in this age, Náciruddunyá waddín Abul Muzaffar Mahmád Sháh, the king. A. H. 846.

Mahmud Shah's coins hitherto published are almost valueless. The cabinet of the Asiatic Society has only one specimen, without date or mist-

town, like No. 8 of Laidley's Plate of Bengal coins (Journal XV, for 1846. Pl. IV). Some have the Muhammadan creed on one side in (so called) Tughrá characters, and, on the other side, the name of the king Nácirud-dunyá waddin Abul Muzaffar Mahmúd Sháh. The margin of the specimen is unfortunately cut away. Mr. Laidley's No. 7 has the same obverse; the reverse is the same as on Hamzah Sháh's coins—*

ناصر اميرالمومنين غوث الاسلام و المسلمين خلد ملكة

But the three inscriptions of this king are very valuable, viz., one from Sátgáon, dated A. H. 861, or 1457 A. D.; one from Dháká, dated 20th Sha'bán, 863, or 13th June, 1459; † and one from Gaur, discovered by General Cunningham, dated 28th Zil Hijjah, 863, or 26th October, 1459.

الله عالى الله تعالى اتما يعمومساجد الله من أمن بالله و اليوم الآخر و اقام الصّلوة و آنى الزكوة و لم يخش الا الله نعسى اوللك ان يكونوا من المهتدين و آنى الزكوة و لم يخش الا الله نعسى اوللك ان يكونوا من المهتدين و قال عزّ من قايل جلّ جلاله و عمّ نواله ان المساجد لله ملا ندعوا مع الله احدا و قال النبتى صلّى الله عليه و سلّم و على آله و اصحابه من بنى مسجدا لله بنى الله له بيتا نى الجدة * * * * المؤيّد بتائيد و الرحمن] * * * * * المؤيّد بتائيد و الرحمن] * * * * * المؤيّد بتائيد و المسلمين المرادين ابوالمظفّر [محمو] د شاه السّلطان خلّد ملكه و سلطانه و اعلى اموة و شانه بغاه الخان الاعظم المعظّم المكرم المخاطب بخطاب

^{*} I am doubtful whether Laidley's Nos. 11 and 12 belong to this king. The obverse of No. 11 consists of seven circles, four with 'Náçir Sháh,' and three with 'assultán;' the reverse is illegible. It is unlikely that the king should have called himself Náçir Sháh on some coins, when other coins and all inscriptions give his royal name 'Mahmúd Sháh.' Laidley's No. 12 is curious; it shews on the reverse the kalimah in clumsy Kufic characters, and on the obverse five circles with 'Mahmúd Sháh assultán.' In the centre of the piece are three rings, thus— °.°. Three rings thus arranged are Timur's arms; vide Vambéry's Bokhara, p. 205.

[†] Received from Dr. J. Wise. It was published in Journal, As. Soc. Bengal, 1872, Part I, p. 108.

[‡] This inscription was first published by me in Journal, As. Soc. Bengal, for 1870, Part I, p. 293, where notes will be found on the locality. The name 'Mahmud' is broken away, only the ddl is left, which in 1870, when I copied the inscription from the stone, I mistook for a nam. General Cupningham's rubbing leaves no doubt that it is a ddl. I therefore republish the inscription with this important correction.

تربیت خان سلّمه الله تعالى عن آفات آخر الزمان بملّه و كمال كرمه فى سفة الحادى و سنّين و ثمانماية ال

God Almighty says, 'Surely he builds the mosques of God, who believes in God and the last day, and establishes the prayer, and offers the legal alms, and fears no one except God. It is they that perhaps belong to such as are guided. And how beautfully does He whose glory shines forth and whose benefits are general, say, 'Surely the mosques belong to God, do not call on any other besides Allah.' And the Prophet says,—may God's blessing rest upon him and upon his house and his companions!—'He who builds a mosque for God, will have a house built for him by God in Paradise.'

*** by him who is assisted by the help of the Meroiful, *** by proof and evidence, the help of Islam and the Muslims, Náçii uddunyá waddín Abul Muzafiar [Mahmá]d Shah, the king,—may God perpetuate his kingdom and his rile and elevate his condition! It was built by the great Khan, the exalted, the liberal, who has the title of Tarbyat Khan—may God Alimighty protect him from the evils of the end of time by His grace and the perfection of His meroy! In the year 861. [A D 1157]

No. 10. The Mahmúd Sháh Inscription of Hazrat Panduah, (Pl. V, No 4)

General Cunningham found this inscription at the Chhotá Dargáh in Panduah.

قال الله تعالى كل نفس ذايقة الموت وقال الله تعالى اذ جاء اجلهم فلا يستأخرون ساعة ولا يستقدمون و فال الله تعالى كل من عليها فان ويبقى وجه ربّك در الجلال و الاكرام و انتقال مخدرما العلامة استان الائمة برهان الامة شمس الملة حبّة الاسلام و المسلمين بابع الفقراء و المساكين مرشد الواصلين والمسترشدين من دار العداء الى دار البقاء التامن والعسرين من ذى الحبّة مى يوم الاندين و كان ذلك من السّدة التاسف و الستين و ثمانماية في عهد سلطان السّلطين حامى بلاد اهل اسلام و المسلمين واصر الدنيا و الدين ابوالمظفّر محمود شاه سلطان صانه الله بالامن و الامان وبغي هذا الروضة خان الاعظم لطيف خان سلمه من البليات و الامان

God Almighty says, 'Every creature tasteth death' (Qor., III, 182). He also says, 'When then fate comes, they cannot delay it an hour, nor anticipate it' (Qor., X, 50). He also says, 'Everything on earth fadeth, but the face of Thy Lord remainst full of glory and honor.'

Our revered master, the teacher of Imams, the proof of the congregation, the sun of the Faith, the testimony of Islam and of the Muslims, who bestowed advantages upon the poor and the indigent, the guide of saints and of such as wish to be guided, passed away from this transient world to the everlasting mansion, on the 28th Zil Hijjah, a Monday, of the year 863, during the reign of the king of kings, the protector of the countries of the Faithful, Naçiruddunya waddin Abul Muzaffar Mahmud Shah, the king,—may God keep him in safety and security! This tomb was erected by the great Khan, Latif Khan,—may God protect him against evils and misfortunes!

XIII. Ruknuddi'n Abul Muja'hid Ba'rbak Sha'h.

The histories agree in calling him the son of Náçir Sháh, i. e., Mahmúd Sháh, and in assigning him a reign of seventeen years. The Riyáz says, seventeen, or sixteen; and the latter statement is evidently nearer the truth, as by the preceding inscription Bárbak cannot have commenced to reign before 864.

To judge from the Tribeni inscription published by me in this Journal for 1870, p. 290, it would appear that Bárbak as prince was governor of south-western Bengal in 860; but the inscription styles him 'Malik,' not 'Sultán,' from which it is clear that he was no rebel.

The following inscription, which Mr. E. V. Westmacott found in Dínájpúr, is very valuable, as it proves that Bárbak was king in the very beginning of 865.

No. 11. The Bárbak Shák Inscription of Dínájpúr.

بسم الله الرّحمٰن الرّحيم • نصر من الله و فتح قريب و بشر المومنين • فالله خير حافظا و هو ارحم الرّاحمين •

بناء المسجد في العهد السلطان ابن سلطان ركن الدنيا و الدين ابو المجاهد باربكشاء سلطان ابن محمود شاء سلطان خلّد الله ملكه و سلطانه بعكم اشارة خان اعظم و خاقان معظم بهلوى العصر و الزمان ألغ اقرار (؟) خان سرلشكر و وزير باني خيرمسجد مذكور وموسّت كردة روضه خان اعظم و خاقان معظم الغ نصرت خان جنگدار و شقدار معاملات جور و برور و محلّهاء ديگر في التّاريخ السّادس و عشر من الشّهر الصّفر ختمه الله بالخير و الطّفر شهورسنة خمس وستّين و ثمانماية ال

In the name of God the merciful and the clement! A victory from God and a near success, and announce it to the Faithful (Qor. LXI, 18). God is excellent as a protector, and He is the most merciful of the merciful (Qor. XII, 64).

The building of this mosque (took place) in the reign of the king, the son of a king, Buknuddunyá waddín Abul Mujáhid Bárbak Sháh, the king, son of Mahmúd Sháh, the king, may God continue his kingdom and rule — by the direction of the great Khán, the noble chief, the hero of the age and the period, Ulugh Iqrár (?) Khán, commander and wazír, builder of this religious edifice, the said mosque. And the repairer of the tomb (is) the great Khán and noble chief Ulugh Nucrat Khán, the jangdár and shiqdár of the affairs of Jor and Barúr and of other Mahallahs. Dated, the 16th day of the month of Safar,—may God bring it to a happy and successful end!—of the year 865. (1st December, 1460, A. D.)*

Note on a Bárbak Sháh Inscription from Dínájpur.—By E. VESEY WESTMACOTT, Esq., C. S.

'I send a rubbing of an inscription of the reign of Barbak Shah, A. H. 865. It states him to have been the son of Mahmood Shah, a point upon which a bit of additional evidence is not without value. It is very clearly cut on the usual black stone, which is commonly called basalt, but which is more like a slate. In one place I found the surface flaking off, and so brittle, that I was afraid to clear it of the whitewash, with which it was clogged, as thoroughly as I should have liked. The slab is about twenty-two inches by ten, and the inscription is in five lines.

'It is let into the eastern front of a little brick-built mosque adjoining the grave of Chihil Ghazee, the Peer, mentioned by Dr. Buchanan in his report on Dinagepore, p. 29. The grave, surrounded by an iron railing, is 54 feet long, and is supposed to correspond to the stature of the saint. It is on the north side of the path up to the mosque, some hundred yards to the west of the Darjeeling road, four miles north of Dinagepore, and not far from the Gopalgunge temples. The Mootawallee is a very ignorant fellow, and I have found out nothing of the Peer beyond his name.

'The founder of the mosque was "Shikdar of the affairs of Baroor," and of another place. Baroor I take to be the parganah of that name, now in Poorniah, outside the western border of Dinagepore.

'On each side of the inscription has been let into the wall a stud, or circular piece, of the same stone, which have on the right side of each a groove, as if for a clamp, which makes me think they were not originally cut for their present position. They are about eight inches in diameter. The centre of each bears in Tughra the muhr i nubuwwat or 'seal of prophetship,' surrounding this is an inscription of which I send rubbings, but which neither the Moulawi nor I can decipher. In an outer ring, half an inch lower, the northern stone bears the inscription—

* I take this opportunity to correct the wrong reading of a title in the Barbak Shah Inscription published by me in this Journal, for 1870, Pt. I., p. 290, Inscr. VII., where for اجاده او عن المعالم المعال

این نقشهٔ مهر نبوت که درمیان در شانهٔ مبارك محمد مصطفی ملی · الله علیه و سلم بود ۱۱

This is the picture of the seal of prophetship which was between the two shoulders of Muhammad Muctafá—may God bless him!

'As door steps to the mosque and to the enclosure surrounding the grave are pieces of hewn stone, similar pieces lying close by; they are more or less carved and appear to be parts of doorways. Such stones are common in all parts of the district, and are said by tradition to have been brought from Bannagar, near Debkot. They are similar to the remains of Gour and Poroowa [Panduah]. On the south side of the path is the female portion of a ling, of large size, a queer ornament for the premises of a Mahomedan saint.

'The mosque is somewhat ruinous, the roots of plants are tearing it in pieces. I think that it is of greater antiquity than most in the district, from the strength of the brick arches, the workmanship of the doine, and the fact that the hewn stones which are built into the inner side of each archway, have been cut to fit their places, although bearing marks of clamps to show they have been taken from another building.

'Three archways, twenty-eight inches wide and nearly six feet high, lead into a vestibule twelve feet by five and a half, at each end of which a similar archway opens to the north and south. Three more archways lead into a chamber, twelve feet square, surmounted by a dome, now cracked in several directions. In the west wall are three niches, and two small archways on the north and south lead into the open air. On the inner side of each of the ten archways, a little below the spiring of the arches, hewn stones, six or eight inches thick, are carried through the whole thickness of the wall which is three feet through. It is unusual in Dinagepore to find that the workmen have dressed the stone as they have here.

'It is usual to build them in just as they are, often with most incongruous Hindoo carvings upon them.'

Regarding the "seal of prophetship," it is said in the Madarijumnubuwwat by 'Abdul Haq of Dihlí, that the seal between the shoulders of the Prophet was a thing raised above the surrounding parts of his blessed body, resembling the body in colour, smoothness, and brightness. And it is stated in the Mustadrik that Wahb ibn Munabbih said that no prophet was sent on earth that had not the sign of prophetship on his right hand, except the Prophet, who had the sign between the shoulders. Shaikh Ibn Hajar in his commentary to the Mishkát says that the seal contained the words in the seal contained the words of the case of the cas

Some traditions say that the seal was of light, and others, that it vanished from the skin when the Prophet expired, so much so that people knew by its disappearance that the prophet was really dead. Several authorities compare the seal to the egg of a pigeon: some call it a 'saè, 'a red fleshknot,' and others say that it was a wart covered with hair.

Marsden gives a Bárbak coin which clearly shews the year 873. The cabinet of the Asiatic Society of Bengal contains the following:—

Vide Pl. IX, No. 7. New variety. Silver. Weight 164.025 grains. (Asiatic Society's Cabinet.) A specimen in the possession of Bábu Rájendralála Mitra weighs 164.335 grains.

OBVERSE. -- * * * العالم العادل * * * الله السلطان العالم العادل * * * REVERSE. -- وهود شاع السلطان و العطم الريشاء السلطان و العطم الريشاء السلطان و العطم الريشاء السلطان و العصود شاع السلطان و العصود شاء السلطان و العصود ال

XIV. Shamsuddi'n Abul Muzaffar Yu'suf Sha'h, son of Bárbak Sháh.

Firishtah represents him as a learned man, who, after his accession charged the 'Ulamá to see the law of the Prophet carried out. 'No one dared drink wine.'

The histories assign him a reign of seven years and six months, and say that he died in 887. If so, the end of his reign was marked by a successful rebellion of his uncle Fath Sháh; but it is just as likely that Yúsuf died early in 886.

Marsden has a coin of this king without year, and Laidley gives a new variety of 884.† General Cunningham's inscriptions give the following dates—

- 1. Panduah, 1st Muharram, 882, or 15th April, 1477.
- 2. Hazrat Panduah, 20th Rajab, 881, or 8th October, 1479.
- 3. Gaur, 10th Ramazán, 885, or 13th November, 1480.

No. 12. The Yúsuf Sháh Inscription of Panduah, Húgli District.‡ (Pl. VI, No. 1.) A. H. 882.

قال الله تعالى الله المساجد لله فلا تدعوا مع الله احدا و قال عليه السّلام من بنى مسجدا في الدّنيا بني الله له في الآخرة سبعين قصرا • بنى المسجد في عهد السّلطان الزّمان المويّد بتائيد الدّيّان خليفة الله بالحجّة

- * Vide also Journal, As. Soc. Bengal, 1870, Part I., p. 299, note.
- † Bábu Rájendralála Mitra has a specimen (like Laidley's) of 883 dip. The margin, similarly to Fath Sháh's coins, contains shamrocks separated by dots. Weight 163:65 grains.
 - 1 Vide, Journal, As. Socy., Bengal, 1870, Pt. I., p. 800.

و البرهان السّلطان ابن السّلطان ابن السّلطان شمس الدّنيا و الدّين ابو المظفّر يوسف شاء السّلطان ابن باربكشاء السّلطان ابن محمود شاء السّلطان خلّد الله ملكه و سلطانه بني هذا المسجد المجلس المجالس مجلس معظم المكرم صاحب السّيف و القلم بهلوى العصر و الرّمان الغ مجلس اعظم سلّمه الله تعالى في الدّارين مؤرّخا في اليوم الرابع الغرة من شهر محرم سنة الني و ثمانين و ثمانياية و تم بالخير اا

God Almighty says—'Sarely the mosques belong to God. Do not call on any one besides Allah. And he upon whom Gou's blessing rest, says, 'He who builds a mosque in the world, will have seventy castlos built for him by God in the next world.' This mosque was built during the reign of the king of the age, who is assisted by the assistance of the Supreme Judge, the viceregent of God by proof and evidence, the king, the son of a king who was the son of a king, Shamsuddunyá waddín Abul Muzaffar Yúsuf Sháh, the king, son of Bárbak Sháh, the king, son of Mahmád Sháh, the king—may God perpetuate his kingdom and rule! The mosque was built by the Majlis ul Majális, the great and liberal Majlis, the lord of the sword and the pen, the hero of the age and the period, Ulugh Majlis i A'zam—may God Almighty protect him in both worlds!

Dated Wednesday, 1st Muharram, 882. Let it end well!

No. 13. The Yusuf Shah Inscription of Hazrat Panduah. A.H. 885.

قال النّبيّ ملّي الله عليه و سلّم من بني مسجدا لله بني الله له قصرا في الجدّة و بنى هذا المسجد في زمن السّلطان العادل الباذل شمس الدنيا و الدّبن ابر المظفّر يوسف شاه السّلطان بن باربك شاه السّلطان بن محمود شاه السّلطان خلّد الله ملكه و سلطانه مجلس المجالس مجلس اعلى أعلاء الله تعالى شاده في الدّارين و كان ذلك في التّاريخ هجرة النبيّ صلّى الله عليه و سلّم في يوم الجمعة عشرين شهر رجب رُجب قدرة سنة اردم و ثمانين و ثمانيانة اا

The Prophet (may God's blessing rest upon him!) says, 'He who builds a mosque for God, shall have a castle built for him by God in Paradise.' This mosque was built in the reign of the just and liberal king Shamsuddunyáwaddín Abul Musaffar Yásuf Sháh, the king, son of Bárbak Sháh, the king, son of Mahmád Sháh, the king,—may God perpetuate his kingdom and rule!—by the Majlis ul Majáis, the exalted Majlis,—may God whose dignity is exalted also exalt him in both worlds! And this took place on Friday, the 20th Rajab (may the dignity of the month ingrease!) of the year 884, according to the era of the flight of the Prophet, upon whom God's blessing rest!

No. 14. The Yusuf Shah Inscription of Gaur. A.H. 885.

The Prophet, &c. &c., [as before]. This mosque was built in the reign of the king, the son of a king who was the son of a king, Shamsuddunyá waddín Abul Muzaffar Yúsuf Sháh, the king, son of Bárbak Sháh, the king, son of Mahmúd Sháh, the king. The mosque was built by the great Khán, the exalted Kháqán, * * * * * * [not legible.]

Dated, the 10th day of the blessed month of Ramazán, 885.

A rubbing of another Yúsuf Sháhí Inscription has been received from Dr. J. Wise. Dr. Wise says—"The inscription is from one of the four mosques which surround the tomb of Sháh Jalál at Silhat. It is a fine *Tughrá* inscription, but unfortunately one-third of it has been built into the masonry, the slab forming the lintel of the door!"

The inscription is-

المعظم الدستور الساعي في الخيرات و المبرات المجلس الاعلي حفظ الله على الآفات معدد المعلى على الآفات معدد المعلم الناسع على الآفات معدد المعلم الناسع العلم المعلم الناسع المعلم

*** Abul Muzaffar Yúsuf Sháh, son of Bárbak Sháh, the king, son of Mahmúd Sháh, the king—uny God perpetuate his rule and kingdom! And the builder is the great and exalted Majlis, the waxir (dastúr), who exerts himself in good deeds and pious acts, the Majlis i A'lá—may God preserve him against the evils and **

To judge from Dr. Wise's rubbing, the inscription, in point of beauty, ranges immediately after the Sikandar Sháh inscription No. 8, mentioned above, and it would be well, if the Sar i gaum, 'the head of the clan,' as the Mutawalli of the tomb is called, would take steps to have this beautiful inscription taken out of the masonry, and thus restore it to light and history.

Dr. Wise has also sent the following interesting note on Shah Jalal.

Note on Shah Jalal, the patron saint of Silhat.—By Dr. J. Wise, Dila'kk.

The following abridgment of the life and miraculous adventures of Sháh Jalál, the conqueror of Silhat in the 14th century, is taken from the Suhail-i-Yaman, written by Náçiruddín, late Munçif of Silhat; his work was composed in the year 1859. It is an abstract of two earlier histories, one of which is called the "Risálah of Muhí-uddín Khádim;" the other, by an unknown author, is designated the "Rauzatus-Salátín.'

According to the Muncif, Sháh Jalál Mujarrid Yamaní was the son of a distinguished saint, whose title of Shaikhush-Shuyúkh is still preserved. He belonged to the Quraish tribe. Sháh Jalál's father was named Muhammad; his grandfather Muhammad Ibráhím. His mother was a Sayyidah. She died within three months of the birth of this her only son. His father died fighting in a jihád against the infidels.

The youth was adopted by his maternal uncle Sayyid Ahmad Kabir Suhrwardi, a Darwish of no mean accomplishments, who had studied under the renowned Shah Jalal ud-din Bukhari.

For thirty years Sháh Jalál is said to have lived in a cave without crossing the threshold. He was at last summoned from his seclusion by his uncle, owing to the following circumstance. One day seated in front of his house at Makkah, lost in contemplation, Sayyid Ahmad saw a doe big with young approach him. The doe related how a lion had appeared in the wood in which she lived, and was killing all her comrades. She finally requested him to come and drive away the brute. Sháh Jalál was called forth from his cave, and directed to go and turn out the lion. On the way he puzzled himself what was to be done when the lion was seen. Unexpectedly, however, he met the animal, and the lustre which shot from his eye was so dazzling, that the lion fled and was heard of no more.

On his return, Sayyid Ahmad was so pleased with his behaviour, that he gave him a handful of earth and told him to go forth and wander over the world, until he found earth of similar colour and smell. Where he did, he was there to make his abode.

Hindústán was then the land to which adventurers directed their steps, and Sháh Jalál followed their example. He passed by a city of Yaman, the king of which was informed that a great Darwish was near. He accordingly sent a cup of deadly poison instead of sharbat, to test his power. Sháh Jalál at once divined its nature, and informed the king's messengers that the instant the draught was swallowed, the king would die. The poison was quaffed without injury to the saint, but, as foretold, the king died.

Sháh Jalál proceeded on his course, but four days afterwards he was overtaken by the Sháhzádah, who had determined on leaving his kingdom and on following the saint in his wanderings.

After journeying for many days, they arrived at Dihlí, where the celebrated Nizám-uddín Auliyá then resided. When Sháh Jalál entered the city, Nizám-uddín was sensible of the arrival of a saint. He, therefore, sent messengers to search for him and to invite him to come and eat with him. Shah Jalál accepted the invitation and gave the messengers a bottle filled with cotton, in the centre of which he placed a live coal. The receipt of this wonderful bottle satisfied Nizám-uddín that this was no common Darwish. He accordingly treated him with every honour, and on his departure he gave him a pair of black pigeons.

The narrative is now transferred to Silhat. In a Mahallah of that city, called Tol-takar, resided at this period Shaikh Burhán-uddín. How a Muhammadan got there, or what he was doing so far away from his own countrymen, puzzles Muhí-uddín, who thinks that this solitary believer must have belonged to some Hindú family, and that he could not have been a true Muhammadan. Burhán, the story goes, had made a vow, that if he was blessed with a son, he would sacrifice a cow. A son being born, he performed his vow; but as bad luck would have it, a kite carried off a portion of the flesh and dropped it in the house of a Brahman. The incensed Brahman went to Gaur Gobind, the king of Silhat, and complained. The king sent for Burhán and the child; and on the former confessing that he had killed a cow, the child was ordered to be put to death, and the right hand of the father cut off.

Burhán-uddin left Silhat and proceeded to the court of Gaur. The king on hearing of what had occurred, ordered his nephew (bhánjá) Sultán Sikandar, to march at once towards the Brahmaputra and Sunnargáon with an army.

When news reached Silhat that an army was approaching, Gaur Gobind, who was a powerful magician, assembled a host of devils and sent them against the invaders. In the battle that ensued, the Muhammadans were routed, and Sultán Sikandar with Burhán-uddín fled. The Prince wrote to his uncle, informing him of the defeat and of the difficulties met with in waging war against such foes. The monarch on receiving the news, gathered together the astrologers, and conjurers, and ordered them to prophesy what success would attend a new campaign. Their reply was encouraging, and Naçír-uddín Sipahsálár was directed to march with a force to the assistance of Sultán Sikandar. This re-inforcement, however, did not restore courage to the Muhammadan soldiery, and it was decided to consult with Sháh Jalál, who with 360 Darwishes was waging war on his own account with the infidels. The Sultán and Naçíruddín proceeded to the camp of the saints.

where the Sháh encouraged them by repeating a certain prayer, and promised to join their army and annihilate the hitherto victorious army of devils. Along with the Sháh were Sayyid Muhammad Kabír, Sayyid Hájí Ahmad Sání, Shaikh Abul Muzaffar, Qází Amínuddín Muhammad, Sháhzádah Yamaní, &c., &c.

The advance of this army of saints was irresistible. The devils could not prevail against them, and Gaur Gobind, driven from one position to another, at last sought refuge in a seven-storied temple in Silhat, which had been built by magic. The invaders encompassed this temple, and Sháh Jalál prayed all day long. His prayers were so effective, that each day one of the stories fell in, and, on the fourth day, Gaur Gobind yielded on the promise of being allowed to leave the country.

The terms agreed to, Gaur Gobind retired to the mountains (kohistán). While at his protracted prayers, Sháh Jalál discovered that the earth on which he was kneeling was of the same colour and smell as that given him by the Makkah Darwish. He, therefore, determined on establishing his abode there. With him remained Sháhzádah Yamaní, Hájí Yúsuf, and Hájí Khalíl. The rest of the saints retired with the army.

The remainder of Shah Jalal's life was spent in devotion and in miraculous actions which still live in the traditions of the people. It is believed that Shah Jalal never looked on the face of woman. One day, however, standing on the bank of a stream, he saw one bathing. In his simplicity, he asked what strange creature it was. On being informed, he was enraged, and prayed that the water might rise and drown her. He had no sooner expressed this wish than the water rose and drowned her. Other less questionable actions are related regarding him. For instance, he caused the corpse of Naçır-uddın Sipahsalar, who died at Silhat, to disappear from a Mosque, while the friends were mourning over it. On another occasion he wished that a fountain like the holy Zanzam of Makkah might spring up near his abode, and immediately the fountain appeared.

Shah Jalal was translated (intiqal) the 20th of the "Kali Chand," A. H., 591, in the 62nd year of his age.

Dr. Wise also writes—"It is a curious fact that the Shah is invoked by the Silhat gánjah (hemp) smokers. I have got a Silhat lunatic, who every day before smoking his chillum of tobacco invokes the saint in the following manner:—

Ho! Bisheshwar Lál, Tín lák'h Pír Shák Jaldl, Ek bár, dubárá, Jagannath jí ká piyárá Kháne ká dudh bhát, bajáne ko dotárá. The chronology of the 'Life of Sháh Jalál,' as Dr. Wise observes, is confused. His death is put down as having occurred in 591, A.H., and he said to have visited Nizámuddín Auliá, who died in 725, A.H. Again, according to the legends still preserved in Silhat, the district was wrested from Gaur Govind, the last king of Silhat, by king Shamsuddín in 1384 A.D., or 786 A.H., during the reign of Sikandar Sháh, whilst 'king Shamsuddín' can only refer to Shamsuddín Ilyás Sháh, Sikandar's father.

Dr. Wise also draws attention to the statement made by Ibn Batútah who "from Sadkáwán [Chátgáon] travelled for the mountains of Kámrú [Kámrúp, western Ksám]. ** His object in visiting these mountains was to meet one of the saints, namely, Shaikh Jalál uddín of Tabríz."* Jalál then gives him a garment for another saint 'Burhán uddín,' whom Ibn Batútah visits in Khánbálik (Pekin). Ibn Batútah, as remarked above, was in Eastern Bengal, when Fakhruddín was king (739 to 750, A. H.). But here again the confusion of dates and names is very great. Jalál uddín of Tabríz died, as we saw above, in 642, and the Silhat Jalál is represented as a man from Yaman.† Neither Jalál nor Burhánuddín is mentioned in the biographical works of Muhammadan Saints.

XV. Sikandar Sha'h II.

The Riyáz says that this king was the son of Yúsuf Sháh; the other histories say nothing regarding his relationship. Stewart calls him "a youth of the royal family," but afterwards calls Fath Sháh his "uncle." The Riyáz says that he was deposed on the same day on which he was raised to the throne; the Aín i Akbarí gives him half a day; my MS. of the Tabaqát, two and a half days; Firishtah mentions no time; and Stewart gives him two months.

XVI. Jala'luddi'n Abul Muzaffar Fath Sha'h, son of Mahmúd Sháh.

Fath Sháh was raised to the throne, as "Sikandar Sháh did not possess the necessary qualifications." The histories say that his reign lasted from 887 to 896, A. H., and yet, they only give him seven years and five months (Stewart, seven years and six months). The inscriptions and coins, however, given below shew that he reigned in 886; and if the "seven years and five months" are correct, Fath Sháh could only have reigned till 892 or 998, which agrees with the fact that his successor Fírúz Sháh II. issued coins in 893. Fath Sháh was murdered at the instigation of the Eunuch Bárbak.

Laidley has published two silver coins of this king, of which one seems to have been struck at Fathábád in 892. The following is a new variety.‡

Lee, Ibn Batútah, p. 195.

[†] Vide the Silhat Inscription of 1505, given below under Husain Shih.

[‡] The coin given by Marsden as a Fath Shahi does not belong to this king.

1. Vide Pl. IX, No. 8. Silver. Weight, 158.65 grains. Futhábád, A. H. 886. (As. Soc. of Bengal, one specimen.) Circular areas. The margin consists of ornamental designs, resembling the niches in mosques and rosettes.

مال الدنيا و الدين ابو المطفر فتحشاه سلطان —.OBVERSE ابن صحمود شا8 السلطان مجدة الله الفتح فتحاباد ANY ابن صحمود شا8 السلطان

Jaláluddunyá waddín Abul Muzaffar Fath Sháh Sultán, son of Mahmúd Sháh, the king—may God strengthen him with victory! Fathábád, 886.

The following five inscriptions of this king have been received by the Society—

- 1. Dháká, 1st Zil Qa'dah, 886, or 2nd January, 1482.
- Dhámrái, 10th Junáda I., 887, or 27th June, 1482. Published,
 J. A. S. B., 1872, p. 109.
 - 3. Bikrampúr, middle of Rajab, 888, or August, 1483.
 - 4. Sunnárgáon, Muharram, 889, or beginning of A. D. 1484.
- Sátgáon, 4th Muharram, 892, or 1st January, 1487. Published,
 J. A. S. B., Pt. I, 1870, p. 294.

No. 16. The Fath Shah Inscription of Bandar, near Dhaka. A. H. 886. (Pl. VII, No. 1.)

The Society is indebted to Dr. J. Wise for this important inscription, regarding which he writes as follows—"The inscription was found on an old Masjid at Bandar, on the banks of a K'hál called Tribení, opposite Khizrpúr (Dháká). This K'hál was in former days the junction of the Brahmaputra, Lak'hya, and Ganges. At its opening on the left bank of the Lak'hya, a fort still stands, said to have been built by Mír Jumlah [vide Journal, As. Soc., Bengal, 1872, Pt. I, p. 96]. The place called Bandar is now a mile inland (vide Pl. IV), but during the height of the rains, the K'hál is navigable for native boats. The inscription is the most perfect as yet met with in this District."

قال آلله تعالى وآن المساجد لله فلا تدعوا مع الله احدا ، قال النبى ما ما الله عليه وسلم من بنى مسجدا بنى الله له قصرا فى الجنة ، بنى هذا المسجد المبارك الملك المعظم بابا صالح فى زمان السلطان ابن السلطان جلال الدنيا و الدين ابو المظفّر فتح شاة السطان ابن محمود شاة السلطان خلد الله ملكه و سلطانه فى تاريخ أوّل شهر ذى القعلمة سنة ست و ثمانين و ثمانيا من الهجرة النّبويّة ال

God Almighty says, 'The mosques belong to God. Do not associate any one with God.' The Prophet, may God bless him!—says, 'He who builds a mosque, will have a castle built for him by God in Paradise.'

This auspicious mosque was built by the great Malik Bábá Sálih in the reign of the king, the son of the king, Jaláluddunyá waddín Abul Muzaffar Fath Sháh, son of Mahmúd Sháh, the king—may God perpetuate his kingdom and rule!—on the 1st Zil Qa'dah, 886, A. H. (2nd January, 1482, A. D).

The builder of the mosque appears to have been a very pious man. Three miles west from Sunnárgáon, Dr. J. Wise discovered a mosque built by the same man, and adjoining the mosque his tomb. The masjid is within half a mile of the mosque to which the preceding inscription belongs, and was built in 911, A.II. A portion of the date of the inscription is designedly, as it would appear, chipped off.

No. 17. The Bábá Sálih Inscription of Sunnárgáon.

قال الله تبارك و تعالى وإن المساجد لله فلا تدعوا مع الله احدا بني هذا المسجد المبارك في زمن السلطان علاق الدنيا و الدين ابو المظفر حسين شاه السلطان خلد الله ملكه الملك المعظم المكرم خادم النبي حاجي الحرمين و زائر القدمين حاجي بابا صالح ** * دي * * * و تسعماية من المجرة النبوية اا

God Almighty says, &c. [as above]. This blessed mosque was built in the reign of Sultan 'Alanddunya waddin Abul Muzaffar Husain Shah, the king,—may God perpetuate his reign!—by the great and liberal Malik, the servant of the Prophet, who has made a pilgrimage to Makkah and Madinah and has visited the two footprints of the Prophet, Haji Babá Sálih. Dated 9*1, A.H.

The wanting words are no doubt في سنة حادي عشر, which would be 911. A small slab let in the brick work of Baba Sálih's tomb contains the following date of his death.

No. 18. The Inscription on Bábá Sálih's Tomb.

الله لا اله الا هو ليجمعنكم الى يوم القيامة لا ريب فيه و من اصدق من الله حديثًا !!

• • روضة الحاجي الحرمين الزاير القدمين خادم النبي عليه السلام
 حاجي بابا صالح اله • • • • تاريخ • • ربيع الاول من سنه اثني • • •

O God! There is no God but He. He will surely collect you towards the day of resurrection, and who is more truthful a speaker than God? [Qor., IV. 89.] * the tomb of the pilgrim to Makkah and Madinah, who has visited both footprints of the Prophet, the servant of the Prophet (upon whom be peace!), Haif Baha Salih * (almutawafá, who died) on ... Rabi' I., ... 2.

Thus it seems that he died in A. H. 912. Dr. Wise says—"No one here has heard of the name of this pious man. The neighbourhood of these mosques is very old. Qadam Rasúl (the 'Footprint of the Prophet'), a famous place of pilgrimage, on a mound some sixty feet high, is a little to the north-west. Gangakol Bandar is on the west, and across the Lak'hya River is Khizrpúr with the ruins of what I believe was the residence of 'Isá Khán, mentioned in the A'in i Akbari."

A third mosque built by Bábá Sálih is in 'Azímnagar, District Dháká.

No. 19. The Bábá Sálih's Inscription of 'Azímnagar.

قال النّبيّ صلّى اللّه عليه و سلّم عجلوا بالصلّوة قبل الفوت و عجلوا بالنوبة قبل الموت و بني هذا المسجد المبارك الملك المعظّم المكرّم بابا صالح و قد تم بناء هذا المسجد في أوّل المحرّم سنه ١٠٩

The Prophet—may God bless him!—says, 'Make quick the prayer before the end, and hasten the naubat before death. This blessed mosque was built by the exalted, liberal Malik, Bábá Sálih, and the building was completed on the first Muharram 910 [or 901,—the numbers are unclear].

No. 20. The Fath Sháh Inscription on Adam Shahid's Mosque at Bikrampúr (Dhúká District). A. H. 888.

General Cunningham and Dr. J. Wise have each sent rubbings of this inscription.

قال الله تعالى و ان المساجد لله فلا تدعوا مع الله احدا قال الدبي ملي الله عليه و سلم من بني مسجد! في الدنيا بني الله له مثله في الجدة بدى هذا المسجد الجامع الملك المعظم ملك كانور في زمان السلطان ابن السلطان جلال الدنيا و الدين ابو المطفر فتح شاة السلطان ابن محمود شاة السلطان في تاريخ اوسط شهر رجب سنة ثمان و ثمانين و ثمانين

God Almighty says, &c., [as above]. This Jámi' Masjid was built by the great Malik, Malik Káfúr, in the time of the king, the son of the king, Jaláluddunyá waddín Abul Muzaffar Fath Sháh, the king, son of Mahmúd Sháh, the king, in the middle of the month of Rájab, 888, A. H. (August, 1483, A. D.)

Dr. Wise writes as follows-

'The Masjid of Adam Shahid is in Bikrampur at a village called Qázi Qaçbah, within two miles of Ballálbári, the residence of Ballál Sen. Mr.

1873.]

Taylor, in his "Topography of Dacca" states that Adam Shahid, or Bábá Adam, was a Qázi, who ruled over Eastern Bengal. He gives no authority for this statement, and, at the present day, the residents of the village are ignorant of this fact. They relate that Bábá Adam was a very powerful Darwish, who came to this part of the country with an army during the reign of Ballál Sen. Having encamped his army near 'Abdullahpúr, a village about three miles to the N. E., he caused pieces of cow's flesh to be thrown within the walls of the Hindú prince's fortress. Ballál Sen was very irate, and sent messengers throughout the country to find out by whom the cow had been slaughtered. One of the messengers shortly returned and informed him that a foreign army was at hand, and that the leader was then praying within a few miles of the palace. Ballál Sen at once gallopped to the spot, found Bábá Adam still praying, and at one blow cut off his head.

Such is the story told by the Muhammadans of the present day, regardless of dates and well-authenticated facts.

'The Masjid of Bábá Adam has been a very beautiful structure, but it is now fast falling to pieces. Originally, there were six domes, but three have fallen in. The walls are ornamented with bricks beautifully cut in the form of flowers and of intricate patterns. The arches of the domes spring from two sandstone pillars, 20 inches in diameter, evidently of Hindú workmanship. These pillars are eight-sided at the base, but about four feet from the ground they become sixteen-sided. The mihrábs are nicely ornamented with varied patterns of flowers, and in the centre of each is the representation of a chain supporting an oblong frame, in which a flower is cut.

'The style of this Masjid is very similar to that of the old Goáldih Masjid at Sunnárgáon and to that of 'Isá Khán's Masjid at Khizrpúr.'

No. 21. The Fath Shah Inscription of Sunnargaon. A. H. 889.

General Cunningham has sent a rubbing of the following inscription-

قال الله تعالى و ان المساجد لله فلا تدعوا مع الله احدا * و قال النّبيّ ملّي الله عليه و سلّم من بذي مسجدا بني الله له سبعين قصرا في الجنة * بني هذا المسجد في عهد السّلطان الاعظم المعظّم جلال الدّنيا

Dr. Wise, in one of his letters addressed to the Society, makes the following remark on Sher Sháh's road from the Brahmaputra to the Indus.

[&]quot;I see in the last volume of Elliot's 'History of India' that doubts are expressed of there ever having been a road made from Sunnárgáon to the Indus by Shér Shéh as montioned by Firishtah and others. In this district there are two very old bridges, which local tradition states were constructed by that monarch, and which lie exactly where such a road would have been. One is still used, the other has fallen in."

و الدين ابو ا مظفّر نتج شاه السلطان ابن محمود شاه السلطان خلّد الله ملكه و سلطانه ، باني المسجد مقرب الدولة ملك . . . الدين سلطاني جامدار غير محلّي و سرلشكر و وزير اقليم معظمآباد و نيز مشهور محمود آباد و سرلشكر تهانه لاوق و كان ذلك في التاريخ من المحرّم سنة تسع و ثمانين و ثمانين المناباية ال

God Almighty says, &c., (as before). And the Prophet says, &c., (as before).

This mosque was built during the reign of the great and exalted king, Jaláladdunyá waddín Abul Muzaffar Fath Sháh, the king, son of Mahmúd Sháh, the king,—may God perpetuate his kingdom and rule! The builder of the mosque is Muqarrab uddaulah, Malk......uddín, the Royal, keeper of the wardrobe outside the Palace, the commander and wazír of the territory of Mu'azzamábád, also known as Mahmúdábád, and commander of Thánah Láwúd. This took place during Muharram, 889. (A. D. 1484.)

The geographical names occurring in this inscription have been discussed above.

THE HABSHI' KINGS.

The pretorian band of Abyssinians, which Bárbak Sháh had introduced into Bengal, became from the protectors of the dynasty the masters of the kingdom, and eunuchs were the actual rulers of the country. The very names of the actors during the interregnum between the end of the Ilyás Sháh dynasty and the commencement of the house of Husain Sháh, proclaim them to have been Abyssinian cunuchs;* and what royalty at that time was in Bengal is well described by Abul Fazl, who says that, after the murder of Fath Sháh, low hirelings flourished; † and Firishtah sarcastically remarks that the people would only obey him who had killed a king and usurped the throne. Faria y Souza also says of the kings of that time:—

"They observe no rule of inheritance from father to son, but even slaves sometimes obtain it by killing their master, and whoever holds it three days they look upon as established by divine providence. Thus it fell out that in 40 years' space they had 13 kings successively."

- * Names as Káfúr (camphor), Qaranful (clove), Fírúz and Fírúzah (turquoise), Almás (diamond), Yáqút (cornelian), Habshí Khán, Indíl, Sídí Badr, &c. Camphor was looked upon as an anti-aphrodisiac (vide my Kín translation, p. 385); hence the name was appropriate. The Fath Sháh inscription No. 20 mentions a Malik Káfúr; and we are reminded of the Káfúr Hazárdínárí of 'Aláuddín's roign.
- † 'The kings of Bengala, in times past, were chosen of the Abassine or Æthiopian slaves, as the Soldans of Cairo were some time of the Circassian Mamainkes,' Purchas.

The Habshi kings are Sultán Sháhzádah, Firúz Sháh, and Muzaffar Sháh. Mahmud Shah II appears to belong to the old dynasty.

XVII Sulta'n Sha'hza'dah (Birbak, the Eunuch)

The owner of this odd title icigned either two and a half months (Tabaqat and Pinishtah), or perhaps eight months (Finishtah), or according to a pamphlet which the author of the Riyaz possessed, six months. He was murdered by

XVIII Saifuddi'n Abul Muzaffar Fi'ru'z Sha'h (II) (Malik Indil Halseli)

He had been a distinguished commander under Fath Shah, and proved a good king. According to the histories, he died a natural death after a reign of three years, in \$99,—1 wiong date. The Riyar says that a mosque, a tower, and a reservoir, in Gaur were built by him

The coin published by Musden as belonging to this king, has been shown by Mi Thomas to belong to Piuz Shah Buhmani

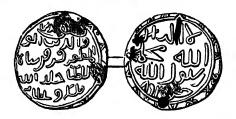
The following passes, from Joso de Barros refers to either this king or Hustin Shah ---

'One hundred your before the Portuguese visited Chitzaon, a noble Arab arrived there from 'Adim (Aden) brun, in, with him 200 men. Seeing the state of the kingdom, he begun to form ambitious projects of conquest. Dissimulating his intentions he set himself up as a commercial agent and on this pretext idded to his followers a reinforcement of 300 Arabs, thus raising his total force to 500 men. Having succeeded through the influence of the Mandarys, who were the governors of the place, in procuing an introduction to the king of Ben, if he assist d that monarch in subduing the king of Orisa his her ditury for. I or this saviete he was promoted to the command of the King's body guid. Soon afterwards he killed the king, and himself ascended the throne. The capital was at this time at Gaur'

The chronology of I may Shah II s reign may be fixed with the help of the following, apparently unique, com, the original of which is in the British Museum. Col Guthia kindly sent the Society a cast, from which the woodcut below has been made. The coin gives the year 893 (A. D., 1488). This year entirely agrees with the receit uned dates of Jaláluddin Fath Shah's reign, and with the carliest ascertained year of Muzaffar Shah. Firuz Sháh II, therefore, reigned from 893 to 895, or 896. The former, 895, is perhaps preferable to 896, because both Mahmud Shah and Muzaffar Shah reigned in 896.

I. Firuz Sháh II Silver. No mint town. A. H., 893. (A. D. 1488) No margus.

لا اله الا الله محمد رسول الله خزانه REVERSE.-- ۱۹۳ الله الا الله



Saifudduny & waddin Abul Muzaffar Firuz Shah, the king,—may God perpetuate his kingdom and rule! There is no God but Allah, Muhammad is the Prophet of God. Treasury issue of 893.

XIX. Na'siruddi'n Abul Muja'hid Mahmu'd Sha'h (II).

He was raised to the throne on Fírúz Sháh's death, though the government was in the hands of one Habshí Khán. After a short time, Habshí Khán, and immediately after, Mahmúd Sháh, were killed by Sídí Badr Diwánah, who proclaimed himself king.

Though the histories call Mahmud-the son of Firuz Shah, there is little doubt that the statement of Hájí Muhammad Qandahárí, preserved by Firishtah, is correct—"In the history by Hájí Muhammad Qandaharí,* it is written that Sultan Mahmud was the son of Fath Shah, and that Habshi Khán was a cunuch of Bárbak Shah, who by Fírúz Sháh's orders had brought up Mahmúd. After Fírúz Sháh's death, Mahmúd was placed on the throne; but when six months had passed, Hab-hi Khan shewed inclination to make himself king, and Sidi Badr killed him." These facts agree well with the following circumstances: First, all histories say that Fath Shah, at his death, left a son two years old, and his mother, at Sultán Sháhzádah's death, declared herself willing to leave the throne to him, who had brought her husband's murderer to account. Secondly, according to Muhammadan custom, children often receive the names of the grandfather; hence Fath Shah would call his son Náciruddín Mahmúd; but as the kunyah must be different, we have here 'Abul Mujahid,' while the grandfather has 'Abul Muzaffar.'

General Cunningham found the following inscription of this king in Gaur; unfortunately, the date is illegible.

The Lak'hnau edition of Firishtah calls him 'Háji Mahmád,' His historical work is not known at the present day.

No. 22. The Mahmud Sháh (II) Inscription of Gaur. (A. H. 896?)
(Pl. VII, No. 3.)

قال النّبي صلّى الله عليه وسلّم من بني مسجدا لله بني الله له قصرا في الجدّة * بني المسجد في عهد سلطان الزّمان بالعدل و الاحسان غوث الاسلام والمسلمين فاصر الدّنيا والدّين الوالحجاهد محمود شاة السّلطان خلّه الله ملكه و سلطانه بني المسجد النخان الاعظم المعظّم الغ مجلس خان *** في القاريخ الثلث و العشرين من شهر ربيع الا [ول سنه ست و تسعين و ثمانماية ؟] اا

The Prophet (may God bless lum!) says, 'He who builds, &c., [as before]. This mosque was built in the reign of the king of the time, (who is endowed) with justice and liberality, the help of Islain and the Muslims, Naçiruddunya waddın Abul Mujahld Mahmudd Shah, the king—may God perpetuate his kingdom and rule!—by the great and exalted Khan Ulugh Majhs Khan(illegible). Dated, 23rd Rabi'

Marsden has published a silver coin of this king, which has likewise no date (vide Numism., Pl. XXXVI, No. DCCXXIV); but, as Laidley correctly observes, he ascribes it wrongly to Mahmúd Sháh of Dihlí. The legend of the coin is—

المؤيد بتائيد الرحمن خليفة الله بالعدل و الاحسان (؟) (P) OBVERSE.— السلطان العادل ناصر الدنيا و الدنن ابو المجاهد صحمود شاه (الدنيا و الدنيا و الدنيا و الدنيا و الدنيا و الدنيا و الدنيا و الدنيان المطان السلطان السلطان السلطان السلطان السلطان السلطان السلطان السلطان السلطان السلطان السلطان المسلطان السلطان المسلطان
The words bil'adl wal-thsán are not clear, they may also be used as elsowhere suggested by me; but the former coincides with the phrase used in the inscription. I cannot see the word of which Laidley gives.

According to the chronological remarks made by me regarding the reign of Firuz Sháh, we have to place Mahmúd Sháh's reign in 896, A. H.

XX. Shamsuddi'n Abul-Nasr Muzaffar Sha'h. (Sidi Badr Diwánah.)

The reign of this king, who is represented to have been a blood-thirsty monster, is said in all histories to have lasted three years and five months; but his death at the hands of the next king cannot have taken place in 903, because his coins and inscriptions mention the years 896 and 898. He must, therefore, have been killed in 899, the first year in which Husain Sháh struck coins.

A Muzaffar Sháh inscription was published by me in the Journal for 1872, p. 107, from an imperfect rubbing. Since then Mr. W. M. Bourke 88

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has sent me a clear rubbing with the date distinct. I, therefore, republish it with a corrected translation.

No. 23. The Muzaffar Shah Inscription of Gangarámpur.
A. H. 896. (A. D. 1491.)

بني هذه العمارة المسجد في عهد المخدوم المشهور قطب اوليا مخدوم مولانا عطا طيب الله ثراة و جعل الجدة مثواة في عهد شمس الدنيا و الدين أبو الدصر مظفر شاه سلطان خلد الله ملكه و سلطانه في القاريخ ست و تسعين و ثمانماية اا

This mosque was built in the time (°) of the renowned saint, Mauláná 'Atá—may God render his grave pleasant and may He make Paradise his dwelling place!—during the reign of Shamsuddunyá waddin Abul-Naçr Muzaffar Sháh, the king—may God perpetuate his kingdom and his rule! Dated, A. H. 896

Mr. Bourke's rubbing shews that the word samánmiah is cut into the second bar, which separates the third line from the second. Below the last line there is another line cut into the lowest bar; but the letters are too small and partly broken to admit of a satisfactory reading. I can recognize the words 'Mullá Mubárak' and mi'már, 'builder.'

Laidley has published a silver coin of this king, the legend of which is (vide J. A. S. B., Vol. XV, for 1846, Pl. V, No. 19)—

شمس الدبيا و الدين ابو النصر مظفر شاة السلطان خلد الله ملكة...OBVERSE

Margin.—Cut away.

REVERSE.—The Kalimah. Year, illegible.

Margin—the four Khalifalis.

The Honorable E. C. Bayley is about to publish a gold Muzaffar Sháhí, which seems to be of 896, A. H.

Muzaffar Sháh, according to the Riyáz, built a mosque in Gaur. General Cunningham has sent the Society a rubbing of another inscription from the Chhotá Dargáh (Núr Qutb 'Alam's Dargáh) in Hazrat Panduah. It is, in point of execution, a very fine inscription.

No. 24. The Muzaffar Shah Inscription of Panduah. A. H. 898.

Vide Pl. VI, No. 2.

قال الله تعالى الله الله تعالى الله الله الله على الله ع

عن العالمين • بذي في البيت الصوفة الروضة قطب الاقطاب قليل محبّبت وهاب شيخ المشايخ حضرت نور الحق والسّرع سيّد قطب عالم قدّس الله سرّة العزيز و نور الله وبرو * بذي هذا البيت في عهد السّلطان العادل البلال الفاضل غوث الاسلام والمسلمين شمس الدّنيا والدّين ابو النّصر مظفر شاة سلطان خلد الله ملكه و سلطانه و (على امرة و شاده بني هذا البيت في خلامة شبخ الاسلام والمسلمين شبخ المشابخ ابن شيخ المشابخ عن غوث سلّمه الله تعالى دائما مؤرّخا في السّابع و العشر من شهر ومضان مبارك في سنة ثمان تسعين ثمانماية ال

God Almighty says, 'Verily, the first house that was founded for men, is the one in Bakkub [Makkah], blossed, and a guidance to all beings. In it are clear signs: the place of Abraham, and who entered into it, was sate, and God enjoined men to visit it, if they are able to go there, but whoseever disbehoves, verily God is independent of all beings. [Qor III 90 to 92)

In this Súfi building the tomb of the pole (qutb) of poles was built, who was slain by the love of the All-Giver, the Shaikh of Shaikhs, Hazrat N úr ul H a q washshara', Sayyid Qutb 'Klam—may God sanctify his beloved secret, and may God illuminate his gravo! This house was built in the reign of the just, liberal, learned king, the help of Islam and the Muslims, Shamsuddunya waddin Abul-Nagr Muzaffar Sháh, the king, may God perpetuate his kingdom and rule, and may He elevate his condition and dignity! This house was built during the khildfat* of the Shaikh ul Islain, the Shaikh of Shaikhs son of the Shaikh of Shaikh, Shaikh Muhammad Ghaus—may God Almizhty ever protect him!

Dated, 17th Ramazan, 898. [2nd July, 1193.]

Nur Qutb 'Alam was mentioned above among the Saints of Panduah.

THE HUSAINÍ DYNASTY.

On Muzaffar Sháh's death in 899, 'Aláuddín Husain Sháh, son of Sayyid Ashraí, usurped the throne. Of the rugn of no king of Bengal—perhaps of all Upper India before the middle of the 10th century—do we possess so many inscriptions. Whilst the names of other Bengal kings scarcely ever occur in legends and remain even unrecognized in the geographical names of the country, the name of "Husain Shah, the good," is still remembered from the frontiers of Orisá to the Brahmaputra.

I have treated of the chronology of the reigns of Husain Shah and his successors in my article, "On a new king of Bengal, &c.," published in the Journal, for 1872, Pt. I, pp. 331 to 340, and according to that paper, we have—

^{*} The reign, if I may say so, of a spiritual teacher.

- 1. 'Aláuddín Abul Muzaffar Husain Sháh, 899 to 927 (929?).
- 2. Náciruddín Abul Muzaffar Nucrat Sháh, 927 (929?) to 939.
- 3. 'Aláuddín Abul Muzaffar Firúz Sháh (III.), 939.
- 4. Ghiyásuddin Abul Muzaffar Mahmúd Sháh (III.), 940 to 944, (defeated by Sher Sháh).

I have now only to describe a few unpublished coins and to give several new inscriptions belonging to the reigns of these kings.

XXI. 'Ala'uddi'n Abul Muzaffar Husain Sha'h.

Marsden (Pl. XXXVIII, Nos. DCCLXXIX and DCCXCIII) has given two different Husain Sháhis, the former of Fathábad, 809, A. H., and the latter of Husainábád, 914, A. H.* Laidley has two new types, one struck at Husainábád, 912, A. II., and the other (vide his plate, No. 21) resembling that of Marsden, but with a different legend. The cabinet of the Asiatic Society contains a few new varieties, with and without dates.

1. Vide Pl. IX, No. 9. Silver. Weight, 163:57 grains. No minttown. A. H. 900. (As. Soc. Bengal, one specimen). Circular areas; no margin.

السلطان العادل علا الدنيا و الدين انو المظفو ــــ Obverse.

حسين شاة سلطان بن سيد اشرف الحسيني خاد ملكة و سلطانه ١٠٠ و REVERSE.—٩٠٠ Col. (futhric in a MS. list of Bengal Coins in the British Museum quotes Husain Sháhís struck at Jannatábad (Husainábád?) in 918 and 919.

The inscriptions belonging to Husain Shah's reign are most numerous; the date of the latest two is 925, A.H. Those of which the Society has received rubbings from General Cunningham are marked [G. C.].

- Munger, 903; mentions Prince Dányál. Published Journal, 1872,
 p. 335. [G. C.].
- 2. Machain, Parganah Ballípúr, Dháká, 22nd Jumáda I, 907, or 3rd December, 1501. Received from Dr. J. Wise,
 - 3. Bonhara, in Bihár, 908. Published, Proceedings 1870, p. 112.
 - 4. Cheran, in Bihár, 909. Published, Proceedings 1870, p. 297.†
- * Marsden reads the latter date 917. On the former coin, the king's first name is spelt علاء الدين, instead of بالدين, with an intermediate waw. This waw should not be read: it arises from a whimsical rule of a class of pedantic Kátibs who maintain that the vowel u after a long á, as in 'Aláu, requires "a support."

The obverse of the latter coin, to which I alluded in the note to p. 301 of the Journal for 1870, Pt. I, is still a puzzle to me, though I have wasted much time in looking at the coin, patiently waiting for a happy gness. I now believe that the second line is an algumatic algumatic bisalfunation, the last word being written disconnected, as sulfanau on the reverse. But the third line is unclear. The weight of the coin is 162 64 grains.

† For a Gaur Inscription of 900, vide Glazier, Report on Rangpore, 1878, p. 108.

- 5. Silhat, 911. From Dr. Wise.
- 6. Máldah, 911. [G. C.]
- 7. Sunnárgáon, 911. Given above, No. 17.
- 8. Hazrat Panduah, 915. [G. C.]. The rubbing is unclear.
- 9 to 11. Gaur, two of 916, and one of 918. [G. C.]
- Sunnárgáon, 2nd Rabí' II., 919, or 7th June, 1513. [G. C.]
 Published, Journal, 1872, p. 333.
 - 13. Birbhúm, 922. Published, Journal, 1861, p. 390.
 - 14. Dhámrái, 922. Published, Journal, 1872, p. 110.
 - 15. Sunnárgáon, 15th Sha'bán, 925, or 12th August, 1519. [G. C.]
- Gaur, 925, or A. D. 1519. Published with plate, J. A. S. B.,
 Pt. I, p. 256.

No. 25. The Husain Shah Inscription of Machain. (A. H. 907.)

قال الدبيّ ملّي الله عليه و سلّم من دني مسجد الله بدي الله له بينا مثله في الجنّة * بني هذا المسجد الجامع لسّلطان المعظم المكرم علاء الدّيا والدّين الوالمظفر حسين شاه السّلطان بن سيّد اشرف الحسيديّ خلّد الله ملكه و سلطانه في النّدي والعشرين من جمادي الارل سده سبع و تسعماية اا

The Prophet says, &c., &c. (as before). This Jámi' mosque was built by the great and liberal king 'Alauddunya waddin Abul Muzatiai Husain Sháh, the king, son of Sayyid Ashiat ul-llusaim—may God perpetuate his kingdom and rule!

Dated, 22nd Jumada 1, 907. (3nd December, 1501).

No. 26. The Husain Shih Inscription of Silhat. A. H. 911.

بسسم الله الرحمن الرحيم * الآمر لهده العمارة البقعة المباركة المنصوبة بدار
الاحسان حرم الله تعالى من مخافة الزمان العابد العالى الكبير * * *شيخ

جلال مجرد كنيايي قدس الله تعالي سرة العزيز في عهد السلطان علار
الدنيا و الدين ابو المظفر حسين شاه الساطان خلد ملكه و سلطانه بعاكرد
خاناعظم و خافانمعظم خالصخان جامدار غير محلي و سراسكر و وزير اقليم
معظمآباد سنه احدى عشر و تسعماية ال

In the name of God, the merciful and the element! He who ordered the erection of this blessed building, attached to the bouse of bearfit (Silhat)—may God protect it against the ravages of time!—is the devotes, the high, the great, * * * * * * * haikh Jalal, the hermit, of Kanyá—may God Almighty sanctify his dear secret! It was built during the reign of Sultan 'Alaudduny ** waddin Abu! Musaffar Husain Sháh, the king, by the great Khán, the exalted Khán, Kháite Khán,

keeper of the wardrobe outside the palace, commander and wastr of the District Mu'azzamabád In the year 911 (A. D. 1505).

In this inscription Shaikh Jalal, whose biography was given under Yúsuf Shah, is called Kanyai, i. e of Kanyá, which appears to be a place in Arabia.

He is said to have 'ordered' the erection of the building. This can only refer to an order given in a dream, as in the case of 'Alí Sháh and Jalál Tabrizi.

No. 27. The Husain Shah Inscription of Maldah. A H. 911.

قال الدّبيّ صلّى الله عليه و سلّم من بذي مسجدا لله بذي الله له بيتا مثله في الجدّة * بني هذا المسجد الجامع السّلطان المعظّم المكرّم علاء الدّبيا والدّبين ابو المظفّر حسين شالا السّلطان بن سيّد اشرف الحسيديّ خلّد الله ملكه و سلطانه في سدة احدي عشر و تسعماية اا

The Prophet says, &c. &c. This Jami' mosque was built by the great and liberal king 'Alauddunya waddin Abul Muzifiai Husuin Shah, the king, son of Sayyid Ashraful Husuin—may God perpetuate his kingdom and rule! In the year 911. (A. D. 1505).

No 28. A Husain Sháh Inscription from Gaur. A. H. 916.

قد بذى هذا الباب الرّضة صخدوم شدخ اخي سراج الدّين السّلطان بي سيد المعظم المكرم علارُ الدّين و الدّين ابو المظفّر حسين شاء السّلطان بي سيد المرف الحسيديّ حلّد الله ملكه و سلطانه في سنة ستّ عشر و تسعماية ال

The door of the tomb of the venerated Shankh Akhi Sinajuddin was built by the great and liberal king 'Alauddunya waddin Abul Muzaffar Husain Shah, the king, son of bayyid Ashraf ul-Husaini—may God perpetuate his kingdom and rule! In the year 916. (A. D. 1510.)

Shaikh Akhi was mentioned above among the saints of Gaur.

No. 29. Another Husain Shah Inscription from Gaur. A. H. 916.

بني هذا الباب الرّضة في عهد السّلطان المعظّم المكرّم علار الدّنيا
والدّبين ابو العظفر حسين شاة السّلطان بن سيّد اشرف الحسينيّ خلّد الله
ملكة و سلطانة و اعلى امرة و شادة و اعز خيارة و برهانة في سنة ستّ
عشر و تسعماية اا

The door of this tomb was built during the reign of the exalted and liberal king, 'Alfudduny's waddin Abul Muzaffar Husain Sháh, son of Sayyid Ashraf ul-Husain',—may God perpetuate his kingdom and rule, and elevate his condition and dignity, and may Herender his benefits and evidence honorable! In the year 916. (A. D. 1510.)

No. 30. A third Husain Shah Inscription from Gaur. A. H. 918.

بني هذا الباب الحصى في عهد السلطان المعظم المكرم علارُ الدّنيا والدّين أبو المظفّر حسين شاء السّلطان بن سبدّ اشرف الحسينيّ خلّد اللهّ ملكه و سلطانه في سدة ثمان عشر و تسعماية ال

This gate of the Fort was built during the roign of the exalted and liberal king 'Alauddunys waddin Abul Muzaffar Husain Shah, the king. son of Sayyid Ashraful-Husain—may God perpetuate his kingdom and his rule! In the year 918. (A. D. 1512.)

No. 31. The Husain Shah Inscription of Sunnargaon. A. H. 925.

قال الله تعالى و ان المساجد لله فلا تدعوا مع الله احدا والله اعلم بالصواب قال النبي صلّى الله عليه و سلّم من بنى المسجد في الدنيا بغي الله له سبعين قصوا في الجدة بني هذا المسجد في عهد سلطان السّلاعين سلطان حسين شاة ابن سيّد اشرف التحسيذيّ خلّد ملكه و سلطانه بني هذا المسجد ملّا عربر اكبر خان بتاريخ پارودهم ماه شعبان سنة خمس و عشرين و تسعماية ال

God Almighty says, Surely the mosques, &c., (as before). And the Prophet says, &c., &c., (as before).

This mosque was built in the reign of the king of the kings, Sultan Husain Shah, son of Sayyid Ashraf ul-Husain—may God perpetuate his kingdom and rule! This mosque was built by Mulla Hizabr Akbur Khan, on the 15th Sha'ban, 925. (12th August, 1519.)

XXII. Na'siruddi'n Abul Muzaffar Nusrat Sha'h.

Of the inscriptions belonging to the reign of this king, I have published three, viz.—

 Sunnárgáon, 929, or 1523. [G. C.] Published, Journal, 1873, p. 888.

- Sátgáon, Ramazán, 986, or May, 1529. Published, Journal, 1870,
 p. 298.
- Gaur, Qadam Rasúl, 987, or 1530-31. [G. C.] Published, Journal,
 1572, p. 338. Vide Glazier, Rangpore Report, p. 108.

A few weeks ago I received a black basalt slab from the old mosque in Mangalkot, Bardwan District, with the following inscription—

No. 32. The Nugrat Shah Inscription from Mangalkot. A. H. 930.

قال النبي ملى الله عليه وسلم من بني مسجدا لله بني الله له بيتا متله في الجنة بني هذا المسجد الجامع في عهد السلطان المعظم السلطان بن حسين السلطان ناصر الدنيا و الدين ابو المظفر نصرتشاه السلطان بن حسين شاه السلطان خلد الله ملكه و سلطانه و بانيه خان ميانمعظم بن مراد حبدر خان دام عزة في سفه ثلتين و تسعماية اا

The Prophet says, He who builds, &c, (as before). This Jám' Mosque was built in the reign of the chalted king, who is the son of a king, Naçirud duny á waddín Abul Muzaftar Nuçrat Shah, the king, son of Husain Sháh, the king-may God perpetuate his kingdom and rule! Its builder is Khan Miyán Mua'zzam, son of Muiád Haidai Khan—may his honor continue! In the year 930, A. H. (A D 1521)

The following important inscription I owe to the kindness of J. R. Reid, Eq., C S., A'zamgarh, N. W. Provinces, who sent me a rubbing. The slab was found on the right bank of the G'hágrá, near Sikandarpúr.

No. 33. The Nuçrat Sháh Inscription of Sikandarpúr, A'zamgaṛh.
A. H 933.

لا اله الا الله محمد رسول الله قال الغبي صلى الله عليه وسلم من بذي مسجدا مي الدنيا بني الله تعالي له سبعين قصرا في الجنة * المتأسس لهذا المسجد في عهد الملك العادل فاصر الدنيا و الدين او المظفر فصرتشاه بن حسين شاة السلطان جعل الله في زمرة عبادة أثر المجيد و هو خافاعظم محددار خان سرلشكر دوة خريد في شهر الرجب ٢٧ سنة ثلث و ثلثين و تسعماية اا

There is no God, &c. He who builds a mosque, &c. The founder of the mosque, during the reign of the just king N & qirudduny & waddin Abul Musaffar N u qrat 8h &h, son of Husain Sh &h, the king—may God place him among the number of his servants!—is, the great Ulur [Ulugh], i. o. the great Khān.i....Khān, commander of the district of Kharid. On the 27th Rajab 983. (29th April, 1537.)

1878.1

The inscription confirms the histories, according to which Nucret Shah extended his authority over the whole of Northern Bihar; and as Kharid lies on the right bank of the G'hágrá, Nucrat Sháh must have temporarily held sway in the A'zamgarh District.

The coinage of this king contains numerous varieties, among which there are several struck by him during the lifetime of his father. The latter coins are mostly of a rude type, and look debased; besides, they are restricted to the Sundarban mint town of Khalifatábád (Bágherhát) and to Fathábád. They either indicate an extraordinary delegation of power or point to a successful rebellion.

Vule Pl. IX, No. 10 Silver. Weight, 154'06 grains. Khalifatábad, 922, A. H. (As Soc of Bengal). Circular areas; no margin.

السلطان بن السلطان باعبر الدبيا و الدبن ابو المظفر ـــ OBVERSE نصرة شاة السلطان بن حسين شاة السلطان الحسيدي خلد ملكة ــ REVLRSE. حليقنانان ۲۲

Vide Pl. IX, No. 11. New variety. Silver. Weight, 163:14 grains. Mint town? A. II, 927. (Cabinet, As. Soc. of Bengal.) Circular areas; no margin.

السلطان بن السلطان ناصر الدبيا و الدبن ابر المظفر ــــ OBVERSE. فصرتشاء السلطان بن حسين شاء السلطان خلد الله ملكه REVERSE. و سلطانه ۹۲۷

Vide Pl IX, No. 12. New variety. Silver. Weight, 162.952 grains. No mint town, or year. Circular areas, and scollops in the margin. The characters are neat. (As. Soc. Bengal)

OBVERSE. - As in the preceding

نصرتشاء السلطان ابن حسين شاء السلطان خلد ملكة [يد هرمزد ؟] REVERSE -- [يد هرمزد ؟

I am doubtful as to the correctness of the last words yad i Hurmuzd, 'by the hand (engraved by) Hurmuzd.' The characters, though smaller, are clear, and yet it is difficult to suggest anything else.

The years of the three Nucrat Shahis published by Marsden and Laidley are not clear; they may be 924 (Marsden) and 927, or 934 and 927. The Cabinet of the As. Soc. of Bengal, besides the above, contains six different types, among which there is a silver coin struck at Nucratábád, 924 A. H., but it is not clear to what locality this new name was applied.

Nucrat Shah's name as prince seems to have been Nacib Khán; at last this would explain why the histories call him Nacib Shah.

He was succeeded by his son

XXIII. 'Ala'uddi'n Abul Musaffar Fi'ru's Sha'h (LII).

The Kalnah inscription (A. H. 939) of this king, which I published in the Journal for 1872, Pt. I, p. 332, is of some importance, and I now give a plate of it (vide Pl. VII, No. 2). The name of this king is only

mentioned in the Riyáz, and though we do not know his source, his statements have, in several instances, been proved to be correct. In the MS. of his work in the As. Soc. of Bengal—the only copy I know of at present—this king is said to have reigned three years, which is impossible; but Stewart found three months in the copy which he consulted.

The Society's cabinet possesses a specimen of this king's coinage, struck in 939, A. H., the same year as mentioned in the Kalnah inscription.

1. Vide Pl. IX., No. 18. Silver. Weight, 163'215 grains. Husaindbád, 989, A. H. Circular areas. The margins are divided into four quadrants, at the beginning of each of which there is the letter nún, and in each quadrant there is an arabesque, which looks like the word نصر. The same design is given on Marsden's Nuçrat Shah.

Fírúz Shah III. was murdered by his uncle

XXIV. Ghiya's-uddi'n Abul Muzaffar Mahmu'd Sha'h (III).

General Cunningham's Gaur Inscription of this king, dated 941, was published by me in the Journal, for 1872, Pt. I., p. 339.

Our Society possesses a coin of Mahmúd Sháh of the same type as the one published by Laidley. He refers the coin to 933; but the Society's specimen has clearly 943 A. H. The concentric circles contain the words badr i sháhí, or 'royal moon.'

General Cunningham lately sent me the tracing of a Mahmúd Sháhí round copper coin, which has the same inscription on both sides, viz. العبد But though the phrase badr i sháhí seems to shew that the coin belongs to Mahmúd Sháh (III.) of Bengal, it would be desirable to have specimens with dates or mint towns.

Mahmud Shah is mentioned in De Barros' work, from which the following facts are taken. Nuno da Cunha, the Portuguese governor of Goa [5,5], sent in 1534 Alfonso de Mello with two hundred men in five ships to Chatgaon, which then again belonged to Bengal, in order to effect a settlement. De Mello, on his arrival, thought it wise to send a few of his men with presents to Gaur, where Mahmud Shah, who tyrannically held the crown, kept his court, in great apprehension of being deposed, but with such state that only his women amounted to the number of 10,000; but though De Mello's men found in Alfa Khan† a friend, the king imprisoned them,

The passage, however, is corrupt. Vide Journal for 1872, Pt. I, p. 339.

⁺ This is, no doubt, the Alff Huseini of Baghdid, mentioned by me in J. A. S. B., 1872, Pt. I, p. 887.

and gave orders to seize De Mello in Chatgaon. The latter was shortly after treacherously captured with thirty of his men and was sent to Gaus, where they were kept strictly confined, because Antony de Sylva Meneses had soon after taken reprisals and sacked Chatgaon. Now at that time Shar Khán and his brother 'Adil Khán had deserted from the Mughul to the king of Bengal. But Sher Khan wished to revenge the death of the youth whom Mahmud had slain,-De Barros means Firuz Shah III.-to procure the Sher Khán, therefore, made war on Mahmúd, and the king throne. asked his Portuguese prisoners to assist him in the defence of Gaur. At the same time Rabelo arrived with three ships sent by the Goa Governor; to demand the release of the captives, and Mahmud after securing their cooperation sent them to Gorij [Garhí] near K'halgáon, where they valiantly, though in vain, opposed Sher Shah. Mahmud, pleased with their prowess, applied to Nuno da Cunha for further assistance, but when Perez de Sampayo came with nine vessels, he found Gaur in the hands of Sher Khan and heard that Mahmud had been killed.

III

I now conclude this essay with my readings and translations of the Bihár collection of rubbings from the time of Muhammad Tughluq to the year 1455 A D

The first inscription is taken from the vault of one Sayyid Ahmad Pir-Pahár, regarding whom nothing is at present known in Bihár; but it seems to refer to the building of a portice by a near relation of Muhammad Tughluq.

No 34. The Muhammad Tughluq Inscription of Bihar. A. H. 737.

The Portuguese describe Gaur as three leagues in length, well fortified; and with wide and straight streets, along which rows of trees were planted to shade the people, "which sometimes is in such numbers that some are trod to death."

- 1. I praise God a hundred times, and abundantly glorify Ahmad, the elect.
- 2. This heaven touching portico was erected
- 3. The world-adorning Muhammad, who breaks through the ranks, the shadow of God in every realm,
 - 4. Abul Mujáhid, the Khalífah of high dignity,.....
 - 5. The builder of this desirable edifice is the slave Mubárak Mahmúd,
 - 6. Of royal descent, the grandson of Shah.. ...
- 7. This dynasty, on account of its elevation, has obscured the memory of Subukticin i Chazi.

When this...was erected, I said, it was 737, A. H. (A D., 1336-37.)

If the name in the sixth line were not broken away, we might fix the name of the builder with the help of p. 454 of Barani's history.

Nos. 35 to 37. The Malik Ibráním Bayyú Inscriptions of Bihár.

The next three inscriptions belong to the Dargáh of Ibráhím Abú Bakr Malik Bayyú, who is par excellence the saint of Bihár. The shrine lies on the hill to the north-west of the town.

Malik Bayyú was first mentioned by Buchanan, who supposed him to be a purely mythological personage. Mr. T. W. Beale next published in his valuable Myfiáh uttawáríkh (p. 90) the first of the following inscriptions. Col. E. T. Dalton also mentions him in his 'Ethnology of Bengal' (p. 211), and says that Jangrá, a Santál Rájah, destroyed himself and his family in the Fort of Chai Champá, Hazáríbágh District, when he heard of Malik Bayyú's approach.

The 'Mujawirs' or custodians, of the shrine claim to be descended from the Malik. According to traditions still preserved among them, Ibráhím Malik Bayyú was an inhabitant of Butnagar, and was sent by Muhammad Tughluq to chastise Háns Kumár, Rájah of Rohtásgarh. The Rájah frequently came to Bargáon, the great Buddhist monastery, to worship oppressed the poor Muhammadans of the country. Now it happened that an old woman, a Sayyidah, killed a cow, in order to celebrate the nuptials of her grandson, when a kite snatched up one of the bones, and let it fall near the place where the Rájah worshipped. The Rájah was, of course, enraged, and put the Muhammadan bridgeroom to death. At the advice of her friends, the old woman complained to Muhammad Tughluq. Being uncertain as to whom he should intrust with the command of an expedition against Háns Kumár, he consulted the astrologers. They told him, "This very night a storm will occur in the city, of such violence that all the lights will be extinguished. In whose house a lamp may be found burning, he is the man best fitted for the undertaking." Ibráhím Malik Bayyú was found reading the Qoran by lamp-light, and next morning he was appointed to command the expedition. He at once advanced to Bihar, and surprised · Rájah Háns Kumár at the Súraj Pok'har, Bargáon. Although the Rájah escaped to Rohtásgarh, the number of the slain was so great, that Mahk Bayyú returned with fifty sers weight of sacred threads. He now occupied himself in subduing the warlike tribes of the province, and unfortunately fell at the moment of victory, his enemy Rajah Hans Kumar having been killed in the same battle. Malik Bayyu's body was brought to Bihár; and the Rájah's head and the sacred threads were buried at the foot of the hill, which still bears the name of Mund-mala.

According to the inscriptions on Malik Bayyu's shrine, he died, apparently peacefully, on the 13th Zil Hijjah, 753, or 20th January, 1353, in the second year of Firuz Sháh's reign and about a year before his invasion of Bengal

No 35

مهد دولت شاه حهادگیر که دادا در دهار ملک نورور شهشاه حهان فیرور سلطان که در ساهان گیدی گشت فیرور ملک سیرور ملک سیرت ملک سیرت ملک بیو نواهیم که ند در دس چو انواهیم کس نور نماندی التحجه نکستنه از دهر نمستچون سیردلااز مهدرس سور نمجرن هقصدو پنجه سفار شد ملك در حنت اس رور حداوندا نقصل حونس نروی کنی آسان حساب آجرس رور

- 1 In the time of the read of the world taking Shah (may the mulk a nauras be in Bihar')
- 2 The king of the world Sultan Firm, who was victorious over the kings of the Universe,
- 3 The angelic Milik Bayyu Ilinhim, who in his faith was as zealous as
- 4 In the month of Zil Hijjth on a Sunday of the time when thirteen (days) of the month had been in grict *
 - 5 In the year 703 A H, to w ledge that day to Paradise
 - 6 O Lord, in Ihy kindness, in il c tic account of the last day light for him!

No 36

این معطع بهار ملك سیف دولست کر سهم تیع او سر افكندی آفنات مساور همی شکستچوههام حوبسان در عالم نقاش بود بت شکی حطاب صفدارصف شکی چوصف آراستی حرب در مساوت اگرچه لشکر سیاره را سکست کمر شید اگرچه لشکر سیاره را سکست کمر در کوق ساحت سرابرد همچاب تاریخ آفتاب که یکشنبه از حهان چون لعل وقت دردل سنگ اربرای حواب بود او منه معظم دی الحجه سیزد ق

- 1 This Jágirdar of Bihár is the Malik, the sword of the dynasty, from the point of whose sword the sun turns his head
- * The poetry is bad enough, but metrical slips also occur The metre is short hazay, and the t in budast' has been clided

- 2. Like his namesake (Abraham), he broke idols, so that in the future world the title of 'Iconoclast' might be given him.
- (He is) the warrior who breaks the ranks (of the enemies); when he arranged his ranks, Rustam fell into feverish restlessness, and Bahman lost his firmness.
- 4. Although the sun defeats the army of the planets, he makes at last for himself a screen of the mountains.*
- 5. On the day of the sun it was, on a Sunday, when, like a ruby in a stone, he (Malik Bayyú) went away from the world, in order to sleep,
- When thirteen days had passed away from the exalted month of Zil Hijjah, and 753 years of the era.

No. 37.

درین گنبذ که هست از روی معنی بقد در از گنبذ افدال بر تر بخفتست شیر صردے کز نهیبش تخفتے شدر اندر بطن شپر مدار ملد ابراهیدم بروبکر که تیغ از بهر حق میزد چوحیدر چنین لشکر کشی کشور کشائی نخیزد دوم اندر هفت کشور کنون چون بر درت افتاد یا رب زرالا لطف بکشای بر و در بهشک رحه دت و کافور رافت کنی دیوار خاکش را معطر

- 1. In this dome, which in a spiritual sense has a higher value than the dome of heaven,
 - 2. Sleeps a lion, from whose dread ... (unintelligible),
- The pivot of the realm, Ibrahim Abú Bakr, who wielded his sword for truth like Haidai ('Ali).
- 4. Such a warfare, such a conquest of realms, will not take place a second time in the seven realms.
- 5. O God, as he has now fallen down at Thy door, open in mercy Thy door to him!
- 6. Perfume the walls of his grave with the musk of Thy mercy and the camphor of Thy forgiveness!

No. 38. The Firuz Sháh Inscription in the Chhotá Dargáh. A. H. 761.

The Chhotá Dargáh of Bihar is the shrine of Badruddín Badr i 'Alam. This faqír came from Mírat'h, is said to have spent a long time at Chátgáon, and settled at last in Bihár, where he died in 844 A. H., or 1440 A. D., the táríkh of his death being بنرر حق پیوست, 'he joined the glory of the Lord.' It is said that the famous Sharafuddín Munyarí had invited him, but Badr delayed in Chátgáon, and only arrived in Bihár forty days after Sharafuddín's death.

The slab stands in the northern enclosure, and curious to say, has on the other side Inscription No. 6, given above. It thus contains the name

* The light of the sun is so strong that the planets are not visible; but even the sun sets and loses himself behind the mountains. So also Malik Bayyú.

of the Bengal Fírúz Sháh on one side and that of the Dihlí Fírúz Sháh on the other. We often find slabs with Hindú carvings on one side and Muhammadan inscriptions on the other; but I have not heard of a Muhammadan inscription having been treated so; for it is repugnant to the feelings of a Muslim to have God's name walled up. The slab is now considered an infallible cure for evil spirits of all sorts.

مجدد گشت این میمون عمارت بعهد پادشاه عدل پرور شهنشاه جهان فیروز شاه آنك ازو آباد شد محراب و منبر بسعي و النهاس بندهٔ خاص برید خطه اندر دور داور ملك سیرت ملك كافی كفایت فهیم نامور در هفت كشور گذشته هفصد از تاریخ هجرت فزوده برد یك بر شصت دیگر همیشه باد شه بر تخت دولت چونام خویش فیروز و مظفر

- 1. This auspicious building was renewed in the reign of the justice-fostering king,
- 2. The lord of the world, Fírúz Sháh, through whom niches and pulpits [i. e., mosques] flourished,
- 3 Through the exertion and at the request of the special slave, (who is) the Reporter (barkl) of the District, in the time of the just king,
- 4. An angelic man, a noble whose guarantee is sufficient, a wise man, renowned in the seven reality.
- 5. Seven Hundred years have passed away of the Era of the Hijrah, and sixty-one besides.
- 6. May the king on the throne of power remain for ever victorious and successful, as (indicated) by his name!

The following two inscriptions are of importance for the history of the Dihlí empire.

No. 39. The Muhammad Shah Inscription of Bihar. A. H. 792.

This inscription belongs to the ruined mosque in Kabír-uddínganj, the most northern Mahallah of the town of Bihár. The mosque has three cupolas, the centre one circular, the others octagonal. Two of its lofty minarets have fallen down.

Regarding the king, vide Mr. Thomas, 'Chronicles,' p. 306. The metre (long ramal) precludes the possibility of an error in the date.

- In the time of the reign of Shah Muhammad, the illustrious, this Masjid became generally used, (by) the grace of God, the Creator.
- When Khwájah Ziyá, son of 'Alá, erected this edifice, it was 792 after the Hijrah. (A D. 1890.)

No. 40. The Mahmud Shah (of Dihli) Inscription of Bihar. A. H. 799.

This inscription belongs to the Khánqáh, or cell, of Ziyá ul Haq, governor of Bihár, who was mentioned in the preceding inscription. The slab was found in the cluster of religious buildings known in Bihár as the Chhotá Takyah, 'the small cloister,' in which there is the tomb of Sháh Díwán 'Abdul Wahháb, who is said to have died in 1096, A. H.

As the inscription mentions Mahmúd Sháh as the reigning king in 799, it follows that Nucrat Sháh was not acknowledged as opposition king by Malik Sarwar of Jaunpúr, to whom Bihár then belonged. *Vide* 'Chronicles,' pp. 312 to 317.

كود اندر عهد سلطان جهان محمود شاه حاكم خطه ضياء الحق بنا اين خانقاه هقتصد نه با نود از سال هجرت رفته دود شد تمام ابن خانقه بادا ضعيفان را يناه

- 1. During the reign of the king of the world, Mahmúd Sháh, Ziyá ul Haq, governor of the province, built this Khángáh.
- Seven hundred and ninety-nine years had passed since the Hijrah, when this
 asylum was completed. May it be the refuge of the weak! (A. D. 1397.)

Nos. 40 to 42. The Mahmid Sháh (of Jaunpur) Inscriptions of Bihár. (A. II., 817 and 859.)

From the preceding inscriptions we see that Bihár, in the 8th century of the Hijrah, belonged to the Dihlí empire. With the establishment, immediately afterwards, of the Jaunpúr kingdom, it was separated from Dihlí. Bihár with Qanauj, Audh, Karah, Dalamau, Sandelá, Bahráich, and Jaunpur, had since 796 been in the hands of Malik Sarwar Khwájahsará, who had the title of 'Sultán ushsharq,' or 'king of the East.' He does not appear to have struck coins, and the fact that the preceding inscription does not mention his name, confirms the statement of the histories that he did not assume the ensigns of royalty. He was succeeded by his adopted son Malik Qaranful,* whose elder brother Ibráhím ascended the throne of Jaunpúr in 804, under the title of Sultán Shamsuddín Abul Muzaffar Ibráhím Sháh. After a reign of forty years, he was succeeded by Náçiruddín Mahmúd Sháh (844 to 862), to whose reign the following three inscriptions belong.

The inscriptions do not mention Mahmúd's kunyah; the coins (Thomas, Chronicles, p. 322) do not even give his first name. But as Naciruddin Mahmúd Shah of Jaunpúr is the contemporary of, and has the same name

^{*} This word is generally derived from the Greek caryophyllum, a clove; but the Ghiyásullughát derives it more correctly from the Hindí karn, 'ear,' and phúl, flower, because women and eunuchs often put a clove into the lobe of the ear. An ear-ornament, resembling the head of a clove, has also the same name. It is possible that Malik Qaranful, like Malik Sarwar, was a eunuch.

as Náçiruddín Mahmúd Sháh (I) of Bengal, care is to be taken not to confound the two.*

The first of the following three inscriptions belonged to a mosque which stood opposite to the Chhotá Takyah, on the opposite bank of the Adyánadí, in Bihár. The mosque has disappeared; only a large square stone platform is left, where the slab was found.

The second and third inscriptions belonged to the ruinous Pahárpúr Jámi' Masjid.

No. 40.

ُ بسم الله الرحمــن الرحيم * قال عليه السائم من بذي مسجدا لله بني الله له بينًا في الجنة !!

شد بقرويق الهي و زطفيل مصطفى مسجد جمعة بعهد شاه دين برور بنا شد بقرويق الهي و زطفيل مصطفى كشو ازشاهان ستاند باج تخشد ترگدا باني اين مسجد آن مسند شريعت هست كو ذات پاكش قرق العين ببي و مرتضا سرور و صدر جهان آن سيد اجمل كفشد ملك و ملت دين و داور دراو القجا كرد ه ترمايش بناء خير ملك السرق كآن مقطع داور دربن خطه نصير ابن بها اين بنا شد استوار ازطاق كسري در بهار كعبة در عظمت برفعت بيت معمور علا غرق ما لارجب بد هشعد و چله هفت سال كاند بن مسجد اقامت شد بتائيد خدا

In the name of God, the merciful and the element. He upon whom be peace (the Prophet) says—" He who builds a mosque for God, for him will God build a house in Paradisc.

- 1. By divine grace and for the sake of Muctafa [the Prophet], the Jum'ah mosque was built in the reign of the faith-neurishing king
- Sháh Mahmúd, son of Ibráhún the Just, a king who takes realms from kings, (and) gives boggars tribute.
- 3. The builder of this mosque is the great lawyer, who is pure in nature, the beloved of the Prophet and of Murtazá ('Alí),
- 4. The chief and the centre of the world, the perfect Sayyid, with whom realm and faith, religion and the royal house, take refuge,
- (Who) ordered this building (to be erected), he the best in the Eastern (Jaunpur) kingdom, the Jágírdár (muqti'), the lord of this district, Naçır ibn i Bahá.
- 6. This building in Bihár is stronger than the portice of Kisrá; it is a Ka'bah in grandeur, and in loftiness the edifice of sublimity.
- 7. It was on the 1st Rajab, of the year 847 A. H., [25th October, 1443, A. D.] when with the assistance of God the first prayer was read (iquat shud) in this mosque.
- The Jaunpur Mahmud Shahi coins generally have the word sulfand, and allude to the investiture by some Khalifah.
- † The phrase مسلوار از طاق کسریا in line 6 is a Hindi construction for the Persian Comparative.

No. 41.

بسم الله الرحمن الرحيم ، قال عليه السلام من بذي مسجدا لله بني الله له بيتا في الجنة .

صفدر گیهان بداه مملکت صدر کریم یافته توفیق خیر از فضل رب العالمین مسجدجامع بناكرد أنجنان كاندرجهان طاق بنياد آمدش با مااوماهي همنشين مذبر و صحوابش از فرط علو مرتبه یافت آن رونق که تحسین میکند روح الامین وس ندا از عالم بالا همى آيد فرود هذه جنات عدن فادخلوها خاادين چارشنبه بیست هفتم مه ز ایام صیام هشصدولی به و نه بودست تاریخ ازساین ۱۵۹ دربقاءخير او احمد همي خواهد؛ جان روح پاكشين شرف الحق والدين رامعين

بارك الله در زمان ناصر دنيا و دين شالا صحمود بن ابراهيم شالا راستين

In the name of God, &c., (as above).

- 1. Blessed be God, in the time of Naciruddunya waddin Shah Mahmúd, son of the rightcous Sháh Ibráhím [of Jaunpúr],
- 2. The hero of the world, the refuge of the kingdom, the noble chief, who through the mercy of the Lord of the Universe has found grace to do good,
- 3. Built this Jámi' Masjid in such a way, that on earth the arch of its structure dwells together with the moon and the fish.*
- 4. Its pulpit and niche, from the excess of the loftiness of (their) dignity, have received such a lustre that even the Rúh ul Amín (the warden of Paradise) has approved (of them).
- 5. And from the upper world, the call comes continually down (to earth), 'This is the garden of Eden, enter it (and live in it) for ever.'
- 6. Wednesday, the 27th of the month of fasting (Ramazán) of the year 859 is the date of its erection (14th September, 1455, A. D.).
- Ahmad (the Prophet) sincerely (ba-ján) desires to protect this religious building for the sake of the pure spirit of Shaikh Sharaf ul-haq waddin.

No. 42.

بسسم الله الرحمن الرحيم ، قال عليه السلام من بني مسجد الله بني الله له بيتا في الجنة اا

مسجد جامع الموقيق خداوند الالا و زطفيل مصطفاء صاحب تهكين و جالا شديعهددولت شاهى كقصيت عدل او مغرب و مشرق گرفت از يشت ماهى تابمالا انكه يور شاه ابراههم عادل سرفراز افتاب سلطنت شاه جهان محمود شاه

^{*} I. s., the building is so high, that it touches the moon, and its foundation is so deep, that it touches the fish, upon which the earth is supposed to rest.

[†] The metre is as bad as the poetry. To get out the metre, we have to read sharf for sharaf—which is Hindústání, and have to scan hagga waddén.

In the name of God, &c.

- The Jimi' Masjid, by the grace of God the Lord, and for the sake of Muctaff, the Lord of power and dignity.
- 2. Was (erected) during the reign of a king, the fame of whose justice surrounds the west and the cast, (extending) from the back of the fish to the moon.
- 3. Namely, the son of Shah lbrahim the Just, the evalted, the sun of Royalty; the king of the world, Mahmúd Shah (two disturbs illegible).
- 6. The glory of the holy temple (in Jorusalem), the honor of the Haram (the temple in Makkah)........
- 7. The slave Fazlullah wrote this on the 27th day of the Fast, A. H. 859 (10th September, 1455, A. D.)

I now bring this essay to a close. It has extended over more pages than I originally had intended. I hope in a short time to put together the collection of inscriptions belonging to the Pathán and Mughul periods, received by the Society from General Cunningham and Dr. J. Wise, to whose unwearied exertions Bengal History owes so much. In the meantime it would be well if other members also, and all such as take an interest in the subject, would send rubbings and coins to the Society; for in the absence of written histories it is only from mural and medallic remains that we can expect to gain a correct knowledge of the history of Bengal.

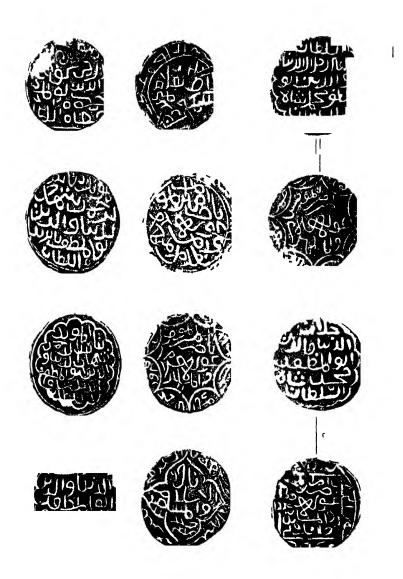
Table of the Independent Muhammadan Kings of Bengal, from A. H. 739 to 944, or A. D. 1338 to 1538.

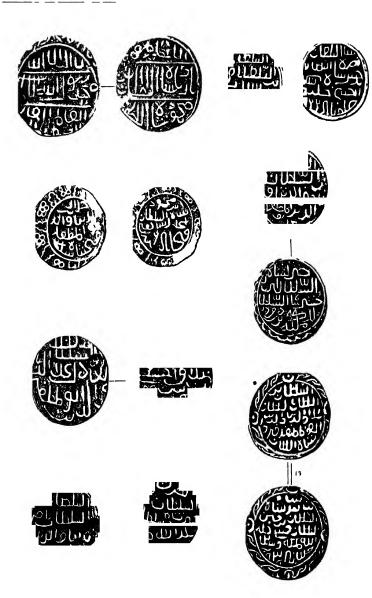
		Statements of the Histories.	Histories.	Ascertained Dates	ed Dates	Probable	
		Duration of reign.	Dates.	by Coins.	by Inscriptions.	duration of reign.	* REMARES.
-	Fathruddin Abul Muzaffar Mubárak Sháh,	2 years and some	739 to 741	739, 741 to 750.	попе.	739 to 750	739 to 750 Eastern Bengal.
69 PB	Ikhtiyaruddin Abul Muzaffar Ghází Sháh, (son) not m 'Alanddin Abul Muzaffar 'Alí Sháh, I y. and 5 m.	not mentioned, 1 y. and 5 m. no	oned. none.	753. 742, 744 to 746.	none none,	751 to 753 740 to 746	751 to 753 740 to 746 Western Bengal.
4	A. The House of Ryds Sheh. Shamsuddín Abul Muzasfar Dyás Sháh,	16 y. and some m.	none.	Western Bengal,	none.	740 to 759	
10	Abul Mujshid Sikandar Sháh, (son) 9 y. and some m.	9 y. and some m.	none,	140, 142, 140 to 758; Enstern Bengal, 753 to 758, As prince, 750 to Rajab, 770, 751, 759, 7781	Rajab, 770.	759 to 792	
•	Ghiyésuddín Abul Muzaffar A'zam Sháh, (son)	7 y. and some m.	to 775	763 to 766; 770 to 773; 776; 779 to 783; 784 to 792. 772: 775; 776; 790 to 799.	попе.	792 to 799	
۵ م	Saifuddín Abul Mujéhid Hamzah Sháh (9002),	d Hamzah Sháh 10 y., or 7 y., or 8 y. 7 m. 5 d., or 8 y. 4 m. 6 d.	to 785 to 788	804. none.	none.	800 to 804 804 to 808	

							•		*	
_		808 to 817	817 to 834	934 to 850 [or to 816?]		846 to 864	864 to 879	879 to 886	988	886 to 892
	none.	none	none.	none.		.61 Sha'bún, 863, 846 to 864 25 Zil Hygah 863	960 (as prince), 864 to 879	882, 884, 885	none.	886, 887 888, 889 beginning of 892
_	none.	812, 816	818, 821 831	836		978	873	883, 884	none.	988
	none	noned.	to 812	to 830		to 862	to 879	to 887	none.	887 to 896
	7 years.	not mentioned.	17 jears.	16 or 18 years.		32 or 27 years.	17 or 16 years.	7у 6 m.	24 days, or 4 day.	7 y. 5 m
B. The House of Rajah Kans.	Bájah Káns, 7 years.	Shihstonddín Abul Muzasfar Báyazíd Sháh,	Jaláluddín Ahul Muzaffar Muhammad Sháh, (son)	Sbamsuddín Abul Mujáhid Ahmad Sháh, (son)	G. The Hovse of Ilyás Sháh restoned.	Nágiruddín Abul Muzasfar Mahmúd Sháh (I), 32 01 27 years.	Buknuddín Abul Mujáhid Barbak Sháh, (son) 17 or 16 years.	Shamsuddín Abul Muzaffar Yúsuf Shah, (son)	Sikandar Sháh (II), (son?)	Jakinddin Abul Muzaffar Fath Sháh, (son of No. 12)
	30	~	91	Ħ		21	ន	14	25	2

Bor 6 or 24 m. 8 or 6 or 24 m. 1 year. 3 y 5 m. 27 y, or 29 y., or terest or 13 y or 16 y. 13 y or less, or 16 y.		Statements of the Histories.	Histories.	Ascertain	Ascertained Dates	Probable	
		Duration of reign		by Coms	by Inscriptions	duration of reign.	BEMARKS.
	D. The Habshi Kings.				•		
	Sultán Sháhzádah Bárbak, the Eunuch	8 or 6 or 23 m.	нопе	none.	none.	893	
	Saifuddín Abul Muzaffar Fírúz Sháh (II),	3 уеагы.	to 899	893	none.	893 to 895	
	Náciruddín Abul Mujáhid Mahmúd Shán (II), (son of No. 16?)	l year.	none.	illegable.	23rd Rabf (°), 896	968	
	Shamsuddín Abul-Naçr Muzaffar Sháh	3 у б т.	to 903	968	868	896 to 899	
	E The House of Husain Sháh.						
	'Aláuddín Abul Muzoffar Husain Sháh	27 y, or 29 y., or 29 y. 5 m.		899, 900, 912, 914, 903, 907, 908, 909	 903, 907, 908, 9 ⁰ 9 911, 915, 916.	899 to 927	 899 to 927 * mentioned in Ba (929?) dion as returned
'Alfaddin Abul Musaffar Ffris Sháh (III), (son)	Négiruddín Abul Muzaffar Nuçrat Sháh, (son)	13 v or less, or 16 y.		922, 924, 927	919, 919, 922, (32, 925, 925, 925, 930, 938, 936, 927 (929 ?)	927 (929 P) to 939	m 901.
Ghiyésuddin Abul Musaffar Mahmud Shah (III), (son of No. 21)—de-	'Alsaddín Abul Muzaffar Fírúz Sháh (III), (800)	3 months	none.	939	939	939	
none.	Ghiyésuddin Abul Muzaffar Mahmúd Sháh (III), (son of No. 21)—de- fested by Sher Shāh		to 944, dies	943	941	940 to 944	

" to VIII





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Part I.-HISTORY, LITERATURE, &c.

No. IV.-1873.

Note on two Muhammadan Coins.—By fun Honorable E. C. Bayley, C. S. I.

I have the honor to bring to the notice of the Society two fine gold Muhammadan coins which I have lately seen. They are both as yet undescribed.

The first is a gold coin of Náçir-uddín Khusrau, the usurper who ascended the throne of Dihlt after the assassination of Qutb-uddín Mubárak in 720 A. H., and reigned a little more than four months.

The coin is in beautiful preservation and weighs about 169 grains.

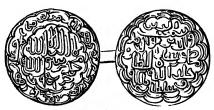
It is of the same type as the silver coin, described as No. 155 of Thomas' 'Pathan Kings.' The marginal inscription is, however, complete and runs,

In the centre, too, of the reverse, the word preceding ""reads clear as """ Náçir ul-rahmán." 'The drawing of the original of Mr. Thoma-' coin as given in the plates (Pl. iii, fig. 73) seems as if the latter had been imperfect at this word. The legends are, therefore, probably the same, except as to the denomination of the coin given in the margin.

The gold coin which I have above described, is in the possession of Col. J. J. H. Gordon of the 29th Regiment Native Infantry, who procured it at Peshawar.

The other coin is also a Muhammadan coin, but belongs to a later date and another mint. It is a coin of the Bengal usurper M u z a ff ar S h á h, and also greatly resembles the silver coin of that Monarch, figured by Marsden, (Pl. xxxv, fig. dexcii) and attributed by him to Shams-uddin Altamsh.

Major Waterhouse has been good enough to photograph this interesting coin, and I enclose a copy of the photograph.



I give the legend as I read it in full, but there may be some doubt as to one word and as to the date, of which more presently.

REVERSE.

Muhammadan profession of faith, or "Kalimah," with the date.

ORVERSE

شمش الديدا والدين ابوالظفر مظفرشاه ملطان خلد الله ملكه و سلطنة

Margin—the names and titles | of the four companions.

The first difficulty is as to the title "ابوالظفر." The legend in this line and that below it, is very much cramped at the end, and is with difficulty legible. I read this word therefore with some doubt, it is possibly meant for ابوالعظفر.

Unfortunately, the chief doubt of the reading centres in the date. The numerals are preceded by two scarcely legible groups of letters, which I take to represent في سنة, and these cover the numerals, which are very ill executed. Attached to the marginal scroll on the left may be seen a triangular mark. This may be either a part of the scroll itself, or it may be intended for the cipher A or 8.

On the other hand, the extreme right hand eipher, if examined by a glass, resolves itself clearly into two, and it may therefore either stand for 7 or 6, or for • and 1, i. e., "0" and "1." The date may therefore be read as 901, or 896, indifferently.

This is unfortunate, for the date of this king is uncertain. We know but little of him. The main facts which seem to be clear are, that he murdered his immediate predecessor Mahmúd Sháh, and at once ascended the throne. After some time a rebellion arose, headed by his eventual successor 'Aláuddín Husain. It would appear, moreover, Muzaffar Sháh was before long driven into the fortified city of Gaur, and that he held his own within this refuge for a very considerable time, defeating all the attacks of his opponents. In the end, however, they triumphod; one account says by the treachery

of his courtiers, whom he had disgusted by his cruelty; another story is that emboldened by success he rashly hazarded a battle outside his fortification, and fell in the contest.

The popular dates assigned to this king vary very much, but it is specifically stated that his reign lasted three years and five months.

One set of dates, that most generally accepted, carries his reign as far down as 903, which would place his accession in either the beginning of 899 or end of 898, A. H.; but, as will be seen, this is probably too late.

The only one point on which there is no doubt is that he erected a building at Gaur in 898. This is testified by the inscription published in the Society's Journal, Vol. XLIII, p. 291, by Mr. Blochmann from the Gaur impression furnished by General Cunningham.

Another piece of evidence, but a less conclusive one, is the coin published by Marsden, Pl. xxxviii, No. DCCCII, and which is dated in 899. It is attributed by Marsden to 'Alá-uddín Husain; but if correctly attributed, as is probable, it is, I think, indirect evidence, not that Muzaffar Sháh was then dead, but that he was still alive in possession of Gaur. For this coin of 'Alá-uddín is struck at Fathábad, a mint of which I believe no other specimens exist, whereas his later coins bear the mint mark usually of "Jannatábád," the well known mint name of new Lak'hnautí or Gaur. It is of course more than probable that 'Alá-uddín Husain, in the flush of victory and with his adversary penned up and beleaguered in a fortress, at once assumed, while himself in camp or at some obscure town, the regal style and struck coins, while Muzaffar Sháh might still have done the same inside his strong fortress.

The facts we have then are these: Muzaffar Sháh was reigning in 898. He was probably still reigning but penned up in Gaur at some period in 899. He reigned three years and five months.

All of these facts are consistent with the dates either of 896 or 901 A. H., but in either case this coin must mark one extreme limit of Muzaffar's Sháh's reign. My own feeling is rather to read the date as 901 A. H., resting mainly on the general assignment of a later date to him by native historians, and on the appearance of the date itself. I am bound to state, however, that such authorities as General Cunningham and Mr. Blochmann prefer to read 896.

This coin was found at Gaur some years ago, and is in the possession of E. Lowis, Esq., C. S.

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Notes on Two Copper-plate Inscriptions of the Twelfth Century, A. D., recording Grants of Land by Govindachandra Deva of Kanauj.—By Ba'bu Ra'jendrala'la Mitra.

In April last, I received from Mr. E. T. Atkinson of Allahabad two copper plates bearing Sanskrit inscriptions, together with a transcript in modern Devanágarí and an English translation of one of them. Mr. Atkinson informed me that the plates "had been found in the village of Basáhi, about two miles north-east of the tah-ílí town of Bidhuná, in the Etáwah District. The village is in a small kherá or mound into which a Thákur cultivator was digging for bricks to build a house. He came on the remains of a pakká house, in the wall of the dálán of which were two recesses (ták), and in each of these recesses was a plate."

No. 1, the smaller of the two plates, measures 16 inches, with an average breadth of 10½ inches. It has a clasp rivetted on the middle of its upper edge to which is attached a chain of two rings of unequal thickness, holding a heavy bell-shaped copper scal. The legends on the seal are a figure of Garuda, the vehicle of Vishnu, and a conch shell, a rude imitation of the famous pánchajanya conch or war trumpet of that divinity, with the name of S ri Govindachandra Deva in the middle. The scal is peculiar to the last line of the Kanauj kings, and implies that those who adopted it were the especial followers of the Vaishuava faith.

The writing on the plate extends to twenty-two lines, the last begining at about the middle of the lower edge. The character is the well-known Kutila, deeply cut, and in an excellent state of preservation.

The record was first sent to Pandit Bápudeva S'ástrí, who had it deciphered and translated by one of the pandits of the Sanskrit College of Benares. The transcript prepared by the pandit is generally correct, and is annexed below with a few slight alterations; but the translation, being loose and periphrastic, has been replaced by another.

The subject of the inscription is the grant, to an astrologer named Khneka, of a village named Vásábhi, in the canton of Jiávani, in the Etáwah district. The donor is Rájá Govindachandra Deva of Kanauj, and the date of the gift, Sunday, the 5th of the waxing moon in the month of Pausha, Samvat 1161, corresponding with the end of December in the year 1103 of the Christian era. The boundary of the village is given in full, and Mr. Aikman, who communicated the plate to Mr. Atkinson, identifies the place with the modern kherá village of Basáhi where the record was found. He says, "The only name like Jiávani in Pargannah Bidhuná is Jiva Sirsání, about ten miles south-east of Bidhuná, which has a large kherá. The name

Bándhama still exists as the name of a village about $2\frac{1}{4}$ miles east of Basáhi. Pusáni may be identified with Pusaoli, two miles south of Basáhi. For Varavvalá the local pandits give Belgur, two miles southwest; for Banthara, two miles west of Basáhi. Sávahada is apparently the modern Sabhad, $2\frac{1}{4}$ miles N. N. W. of Basáhi. All these are kherá villages with which the whole north-cast of the Bidhuná Parganah appears to be studded. Tradition has it that Sahad in the Phaphúnd Parganah, which is now but a kherá, was the site of the elephant stables of the rulers of Kanauj, and, though there is now no vestige of a wall, the villagers still point out the sites of the gates, as the Dihlí Darwázah &c."

The attesting witnesses to the gift were the high priest, the accountant general, and the warder of the palace, the conveyancer being a man of the name of Vijaya Dása, son of Pandit Kuke.

No. 2 measures eighteen inches by eleven and a half. It originally had one or more rings and a seal attached to its top: but they are now lost. Its corners are broken, and the inscription, which extends to twenty-four lines, has been very much defaced by rust, making it quite illegible in some places. Owing to this the pandit, who deciphered the first plate, could not make anything of the record. Careful clearing and an impression taken under a copper plate printing press, have, however, enabled me to read a good part of it, and filling up such portions as are irretrievably lost of the preamble, which is the same as in a record published in the twenty-seventh volume of this Journal, and the concluding imprecatory and commendatory verses from several land grants already published, I have succeeded in restoring the record with the exception of a few proper names of places which are not of any material importance. The portions taken from other records have been enclosed in brackets in the subjoined transcript.

The subject of the patent is the gift of two villages by Govindachandra to a Thákur of the name of Devapála S'armá, son of Thákur Udyi, and grandson of Thákur Yogi, of the Kásyapa clan. The title of the donce and his ancestors appears in its ancient form of Thakkura. The date of the gift is the third of the wane in the month of Phálguna, Samvat 1174, or just thirteen years after the first grant. The dates are given, in both cases, both in letters and figures, and so there is no doubt whatever about the accuracy of my reading.

The preamble of the first grant opens with a reference to a dynasty of which one Gáhadavála was the founder, and Karlla the last prince. One of the descendants, some unknown generations removed from Gahadavála, was Mahiála, and after some generations Bhoja, who does not appear to have been the immediate predecessor of Karlla. Of these several names, that of Bhoja is the most important. As a sovereign of Kanauj, he must be one of the two Bhojas of the Sáran plate noticed by me in my paper "on a Land

Grant of Mahendrapála Deva of Kanauj,"* probably the last who was the same with the "Lord Paramount" named in the Gwáliár inscription translated by me and included in my paper on the "Vestiges of the Kings of Gwalior,"† and noticed also in my essay on the "Bhoja Rájá of Dhár and his Homonyms."‡ The date of the last Bhoja of Kanauj was 885, A. D.,§ and that of the Bhoja of Gwáliar 875, A. D., || showing an interval of only ten years which may reasonably be supposed to have been included in a single reign. This identification would make the dynast? of Gahadavála to be the same with that of Devasákti, which, according to my calculation, commenced in the year 779, A. D.¶

When Karlla, the last prince of the dynasty, died, cannot be ascertained; but it must have been at about the third quarter of the eleventh century. The inscription notices a revolution immediately after his death; perhaps he was destroyed by a rising of his own people, who expelled his descendants from Kanauj and made over the kingdom to Chandradeva, or at least helped him to take it.

The dynasty of the last named prince was founded by Yasovigraha, whose name occurs in a large number of inscriptions; his date, however, is nowhere satisfactorily settled.** His son Mahichandra was the father of Chandradeva. No inscription of either of these has yet been met with. Of Madanapála, the son and successor of Chandradeva, an inscription has been published, bearing date the 3rd of the waxing moon in the month of Mágha, Samvat 1154 = 1097 A. D.†† According to the inscription under notice he was the reigning sovereign in 1103, A. D., when his son Govindachandra, as heir apparent, gave away the village of Basáhi.

The second inscription describes the dynasty of Yasovigraha, but makes no mention of the line of kings which preceded it. According to it Govindachandra was reigning sovereign or Maháraja on the 3rd of the wane in the month of Phálguna, in the Samvat era 1174 — A. D. 1117. So he must have succeeded his father between 1103 and 1117 A. D. On the 6th of the wane in the month of Mágha, Samvat 1182 — A. D. 1125, he gave away a village in the canton of Haladoya,‡‡ and his reign may be assumed to have

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* Ante XXXIII, p. 321.
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[†] Ante XXXI, p. 391.

[‡] Ante XXXII, p. 91.

[§] Ante XXXI, p. 409.

Ante XXXIII, p. 96.

[¶] Ante XXXII, p. 409.

⁴⁶ A summary of all the Yasovigrahas noticed in inscriptions will be found in a footnote to a paper entitled "Of two Edicts bostowing land recorded on plates of copper." Ante XXVII, p. 217.

^{††} Ante XXVII, p. 218.

¹¹ Ante XXVII, p. 247.

extended to the close of the third decade of the twelfth century, and probably to a much later period. His son and successor was Vijayachandra. He is said to have died in 1168 A. D.,* leaving the kingdom of Kanauj to his son Jaychandra, the last king, from whom the country passed to the Muhammadans. There are several copper plate patents extant of this sovereign. Six of them found by Captain Fell at Benares, and now in the Library of the Asiatic Society, bear dates as follow:—

Nos. 1008-3 and G, Samvat 1233 A. D. 1175.

No. 1008-4, Samvat 1234 $= \Lambda$. D. 1176.

Nos. 1008-5, 7 and 8, Samvat 1236 = A. D. 1178.

Lt. Col. Caulfield's Faizábád plate,† Samvat 1243 = A. D. 1187.

His overthrow by the Muhammadans took place in A. D. 1193, which gives a period of about twenty-six years for his reign.

As the history of these sovereigns has been discussed at length by Colebrooke, Wilson, and others, and I have at present neither the time nor the inclination to write a monograph, I shall close these brief notes with a few remarks on the nature of the gift and on the various kinds of rights, taxes, and cesses which they bestowed on the donces.

The gifts, as a rule, are absolute, and to last, in the metaphorical language generally used are such occasions, "as long as the sun and moon will endure," Their resumption is also prohibited with dire imprecations. But no where is any mention made of the right of actual possession of the The first impression produced on reading a copper-plate grant is that the proprietory right of the donor is conveyed to the donee, but looking to the fact that almost invariably there is a clause in the deed which says "the inhabitants and local officers, should render to the donee all rents. taxes," &c., or other words to that effect, the conclusion becomes evident that the right conveyed is, like that of the zamindars, limited to rents, &c., and does not extend to actual possession, which is taken for granted will rest with the tiller of the soil, except of course in the cases of unoccupied land. forests, mines, wastes, &c., which are frequently separately mentioned. This peculiarity in the land tenures of India was first pointed out by Colonel Sykes, and it shows the existence of zamíndárí rights of middle men apart and distinct from the occupancy rights of the cultivators. It shows also that the right of possession did not rest with the king. He was entitled to demand revenue or kara, and cesses, but not to dispossess the occupant at will and pleasure. However extraordinary this may appear to persons who associate the idea of Indian sovereignty with every thing that is arbitrary and autocratic, it is a fact which is in perfect keeping with the laws of the land.

Ante XXVII, p. 218.

[†] Colchrooke's Essays, II. pp. 289, 295, and 296. Journal, As. Soc., II., pp. 341, and 342; XXVII, p. 218. Ante X, p. 98.

According to the *Tattvakaumudi*, there were formerly four classes of tax-gatherers intermediate between the actual occupant on the one side and the king on the other; these were the Grámádhyaksha, the Kautumbika, the Vishayádhyaksha, and the Sabhádhyaksha, and the revenue passed successively through their separate hands before it reached the king.* Whether these persons were paid officers, or owners in some sense or other, I cannot ascertain, but in the *Viváda Chintámani* a rule is quoted which says, "A gift of land made by the king by taking it from its proprietor through anger or avarice, or under a pretext, (i. e. not lawfully resumed) is illegal." †

There are laws quoted in it of the rights of squatters and lease-holders, apart from those of permanently fixed cultivators, who held the position of the ryots of the present day.‡ This becomes the more apparent from the nature of the right of the king in land as defined by Srikrishna Tarkálankára in his commentary on the Dáyabhága of Jimutaváhana. "When the owner of one kingdom," says he, "buys a country or the like from the owner of another, the right acquired in his purchase is that of realising revenue, which the seller had, and not anything similar to the right acquired in land by inheritance, which is also connected with land, and which is not of the same nature with the former, and cannot be produced by its transfer, the discordance being in their natures."§ Accordingly, we find in one of the Sanchi inscriptions a vassal of Chandra Gupta purchasing from one of his own subjects a piece of land, at the legal rate, for 12,500 dínárs for a Buddhist temple.

The rights conveyed by the patents also indicate this very clearly. The first right named in the records under notice is called bhága or "a share" of the produce. It is, I believe, the same with the bhágajota of the present day, in which an owner allows the cultivation of his land by a farmer on the understanding of receiving a share (bhága) of the produce, the cost and labour of cultivation being borne by the latter. The share varies from four to ten-sixteenths, according to the nature of the soil and other circumstances; but it is ordinarily fixed at half the produce, which in the ease of paddy is sometimes meant to include the straw, and sometimes to omit it. Owners of land are occasionally required to supply seed grain; but

- * यथा दि यानाधकाः कोट्निकस्यः करसाद्य विषयाधवाय प्रयक्ति, विषया-धवा सभाधवाय, स च भूपतया दति।
 - † Prasannakumar Tagore's Translation, p. 124.
 - ‡ Ibid., pp. 130-31.

§ चत रव राज्यानगाधिकारिकः सकाग्रात् चन्यव्यतिना जीते राज्यानगादी विजेदस्य स्वाधिकार्यः करप्रकोपयोगिस्य सेव तस्य तनं जायते, न तु दायप्रतिग्रद्यात- सूम्यादिष्टित्तस्य स्वाधिकार्यात् स्वाधिकार्यः तन भूम्यादी तथाविधस्य स्वचन तहिराधात् ताहग्र- स्वाधनगात्रस्यात् समानजातीययास्य योविराधात्।

Bharatachandrá Siromani's edition of the Dáyabhága, p. 18. || Ante Vol. VI, p. 455. this is not common. At the time of Govindachandra, the share was, I believe, a tenth, as I find in the inscription No. 1 the word bhága-kuṭaka-das'a, which means the share (bhága) for a plough-share (Kùṭaka) to be das'a "ten," the "ten" meaning either ten hundredths or one tenth. The ordinary practice of calculating by fractions of the rupee or sixteenths has, I imagine, not been adopted here, as the very next word bandha viñs'ati twenty or a twentieth for mortgages, would in that case mean twentysixteenths, which would be absurd. One-twentieth or twenty-hundredths—most probably the former was the rate of cess for mortgages. But whatever the rate the right was clearly limited to rent, and did not extend to actual possession.

The second right of the zemindar is named Bhoga, literally meaning enjoyment, but most probably intended to imply usufruct, as in the current terms Bhogubandhak, Bhogalabh, Bhogadhikar, Bhogasanad, &c., a mortgage is meant in which the article pledged is permitted to be used in lieu of interest. It might mean the actual possession and enjoyment of the land, but that cannot be the object intended by the conveyancer, for in that case he would not have described it as "payable," and enjoined the inhabitants or ryots to "render it." The condition of payment, or rendering, implies that the land was left in the possession of the ryots, and the donee was still to have some enjoyment of it. This could be effected by allowing the landlord to have the right of using it when the land was left fallow, either as field for grazing his cattle, or taking the grass from the field after the cultivator's crop had been removed from it. A right of this description is enjoyed in the North-Western Provinces to this day; and a case once came up in appeal to the High Court of Calcutta from Behar in which the zemindar claimed the right of taking grass from the field of his ryot, after the ryot had removed his crop. This is indicated in a passane in the Viváda Chintámaní where it is stated that "the produce of seeds thrown from one field into another by a storm or a deluge, is enjoyed by the proprietor of the field," * i. e., the produce resulting without the intervention of the ryot is due to the zemindar, even during the currency of a lease, unless otherwise provided for in the lease.

The next is Kara, i. e., rent proper or revenue, in which a fixed amount, whether payable in money or kind, has to be rendered for the use of land irrospective of the actual produce at any given time. The standard for fixing the rate was doubtless the produce, but when the rate was once fixed, the produce was no longer taken into consideration.

The next is *Pravani kara*, or a toll on quadrivials, i. c., a toll at tu.npikes, it being very unlikely that a traveller was called upon to pay a toll at every cross road. The translator of the Delhi College copper-plate

^{*} Prasannakumár Tagore's edition, p. 131.

fancies that from the mention of this tax, "it may possibly be inferrible that the impoverishment of the imperial coffers had recently given rise to a new species of fiscal exaction;"* but the impoverishment is altogether imaginary; there is nothing to show that Govindachandra's reign was financially a bad one, and needed any extraordinary fiscal measures for relief. the contrary, Govindachandra and his two successors, who exercised supremacy for nearly the whole of the twelfth century, and possessed the finest and richest portion of India, including the Gangetic doab, a good portion of Oudh down to Benares, and an undefinable portion of the tract of country to the south of the Ganges and Jumna from Tikkari to Gwalior, were rich and prosperous, the most distinguished sovereigns of their times, lavish in bestowing entire villages, not unoften two, three, or more at a time, in free gift to Bráhmans, it is extremely improbable that they laboured under pecuniary difficulties. Were the difficulty to be admitted as a fact, still the question would remain, how could the bestowal of the right to raise such a tax relieve the tightness of the imperial exchequer? To make it really beneficial, the donor should have reserved the right for himself, and not given it away to a subject.

These four forms of taxation are mentioned in the second plate, and the grant appears to be limited to the enjoyment of these, which the tenants were to contribute. In the first grant the gift is absolute, including the power of administering justice, the punishment being limited by the nature of the offence, sadrisáparádha danda. But even here the tenants are not altogether lost sight of, nor their rights annulled, for it ordains that the share (bhága) for each plough, kútaka, should be ten or a tenth (das'a: bhága-kútaka-das'a).

The right of the donee in mortgage is fixed at one-twentieth or five per cent., which is somewhat more than the stamp tax of the present day. He is authorised also to raise a tax for beggars—a poor rate—which is to be equal to a prastha, or four kuduvas, which is equal to "forty-eight double handfuls;" but whether that was required to be contributed by every tenant, or for every biggah of land cultivated, I cannot ascertain. The tax is named agu-prastha. A similar rate of tax is also fixed for the administration of justice aksha-patala-prastha. For the watch and ward of the village, a similar rate is likewise fixed. It is called prátihára-prastha or a chaukidári tax, and in some vllages of Bengal, it is still current, though the measure of corn given is different. Royalties are also fixed for mines (ákara), collection of fragrant grass, meaning evidently the wild Bená grass or Khaskhas (turushka-danda); wild tree-cotton (dhara); reeds for mat-making (kata); and trade in precious metals and jewels, collectively called hiranya or gold. In the translation of the Inscription published in the twenty-seventh volume of this Journal (p. 249), the word turushka-danda has been rendered into

"Mahommedan amercements," the translator suggesting that it implies that "the encroachment of the northern invaders were gaining head, and that their dominion was becoming to be recognised;" but I cannot accept this version as correct. It assumes the presence in Etawah of such a Moslem population as would be worth taxing; and that is far from being probable. The word turushka dubtless means a Turk or a Moslem, and it is undeniable that the incursions of Mahmúd Ghaznavi did leave some of his followers scattered in different parts of India, but they did not make up such a population in villages as to make judicial fines imposed on them of any material value. At any rate such fines do not by any means indicate Moslem sovereignity in India, nor does their imposition by Bráhmans under the orders of a Hindu king in the year 1103 imply its extension. be added, that the right of administering justice carries with it that of fining, and the donce who got the right, enjoyed the fines from Hindu and foreign offenders alike, and a special mention of "Mahommedan amercements" was not at all needed. But the most important argument against the theory appears to me to be the position which the word turushka danda occupies in the text. It is preceded by ákara, "mine," and followed by dhara, "tree cotton," and kata "mat reed," and one naturally expects it to be the name of some article of produce; and this is supplied by the old meaning of turushka " an aromatic substance," added to danda, " a stick," an aromatic reed. In the western parts of the Burdwan district, where the khas-khas is common, a royalty is to this day charged by zemindars for permission to cut it.

Transcript of Inscription No. 1.

१० 🦫 नमा भगवते वासुद्वाय॥

तुमार्य चर्चदेवानां द्योगदरम्पाखरे।
चैलाकं यस्य वक्तीवाको।इन्तरसं बिलनयो॥१॥
वंग्रे गाचडवालाको बभूव विजयो च्यः।
सिच्चालस्य जीमान् नलनाभागमित्रभः॥१॥
याते त्रीभाजभूषे विवृधवरवधूनेचसीमातिथिकं
बीकं कीर्णिये गतवित च च्ये च्यात्यये जायमाने।
भर्तारं यं घरिनो चिद्विविभृतिभं ग्रीतियोगादुपेता
वाता विश्वस्य पूर्वे सममनदिच स च्यापतिचन्द्रदेवः॥१॥
दिविष्वित्यतः स्वीन् विष्याय विवस्तान् वसे।
कत्याकुके।करोडाका राजधानीमनिन्दिताम॥॥॥

त्याजुक्कस्त्राचा राजवानातान्यात् ॥ ४॥
तमाव्यति द्विष्टापतिद्वितिष्टं चोणोपतिमेद्नपास इति प्रसिदः।
वैनान्नियम वक्रवः संस्ट्रवन्याः स्वत्तिप्रस्तर्यक्वन्यवन्याः॥ ५॥
तक्षाद्वायत नरेषर्यन्यन्यपादार्यिन्युमस्ता मस्तिप्रतायः।
चे।चीपतीन्द्रतिस्को रिपुरक्षभत्ती नोविन्यम् इति विमृतराक्षपुषः॥ ६॥

संबत् सद्द्विके स्कवद्यानरक्षताक्ष्यके पीवमासे ग्राह्मपचे पचन्यां रविदिने संबत् १९६९ पीवसुद्धि रवी ॥

चयेषायितकायां एक छक्क कावचयकारिकां यनुवायां द्वाला यथाविधानं मन्द्रदेवच्राविमनुष्यभूतिपद्धं सर्पयिला । स्त्र्यं भद्दार्थं सर्वेककारं भगवनं भिवं विश्वाधारं वास्त्रदेवं
सम्भ्रयं उत्तवचं उत्ता । जीचावनीपत्तर्श्यां वस्त्रीयासे समस्त्रममजनपद्दान् स्रमीधयित । यथा पासीऽयं मया चेववनसभूकाद्याकाग्रपातास्त्रस्तिः सद्यापराधद्यः
मामकुटकद्य, वन्न, विश्वति, च्यूप्रस्त्राचपटस्त्रस्त्र, प्रतीचारप्रस्ताकत, तुष्ट्यद्यक्ष्यकर, चिर्व्यस्वीद्यसंयुक्तः । पूर्वसां वान्यसीच्यामः पश्चिमायां वद्यस्त्रसामः द्विच्यां पुरेषिपासः स्तर्त्यां सावचद्यासः स्वं चतुराधाटिवद्यः । मातापिवोरात्रसम्ब्र्यस्य प्रस्तुविवद्यये जस्त्रबुद्दाकारं जीवितं दानभाग्रकतां स्वर्त्तीं श्वाला । वद्यस्त्राधिने
गीतसमोवाय गीतमः, चित्रवा, चित्रदाय सेमेपीवाय कुस्त्रेण्याव चातिविदे
प्राच्यस्याकेत्रस्य सद्यात्रस्य स्वर्तेव सत्तर्वाय सेमेपीवाय कुस्त्रेण्याव चातिविदे
प्राच्यस्यकेत्रस्य स्वर्त्यस्य स्वर्तेव स्वर्त्तायस्यस्त्रामी कुस्पूतेव चसीऽदक्षेन चन्द्राकं यावत् ग्रासनलेन प्रदक्तः ।

ये यास्त्रिक्त सचीक्षतो सम कुछे किंवा परिसान् पुर-सेवामेव सयाञ्चलिर्विरिचिता नादेयमस्मात् कियत् । दूवोमावसपि स्वथमेनिरता द्यं मया पास्थतां वायुर्वास्त्रित तप्स्रिति प्रसपनः चुना मुनीनां वसः॥ १॥

विक्रितं सुधा भृक्ता राजिक्षः सगरादिक्षिः।

यस्य यस्य यदा भूनिकास्य तस्य तदा फल्कम् ॥ १ ॥
सद्तां परद्तां वा यो हरेत वसुन्धराम्।

स विष्ठायां क्रिभेर्वा पिटक्षिः सह मज्जिति ॥ १ ॥
भूमिं यः प्रतिस्टक्षाति यसु भूमिं प्रयक्ति ।
तानुमी पुष्पकर्माणा नियतं सर्गवासिनी ॥ ४ ॥
तङ्गानां सहस्वेष वाजपेयस्तेन च ।

ववां कोटिप्रदानेन मूमिह्नां न श्रद्धाति ॥ ॥ ॥

स्तिकतस पुरे। सितत्रीजामूकमे समकत्रीत्रा स्रापप्रतीसः दशीमीतसी एवां सम्बत्धा पण्डितः श्रीकृकपुवविकथदार्पनिति ॥

Translation of No. 1.

Om! Salutation to the glorious Vásudeva.

- I adore Dámodara, the first among the Gods, the three folds of skin on whose belly are said to be the three worlds in his lap.
- In the dynasty of Gáhadavála was born the victorious king, comparable to Nala and Nabhága, the son of the auspicious Mahiála.
- 3. When king Bhoja had become an object of sight to the charming wives of the gods, (i. e. died); when the career of king S'ri Karlla had come to a close, when there was a revolution, then Chandradeva became king. On gaining him, who was like the lord of heaven, for her husband, earth was gratified. He was a protector of the universe.
- 4. Having brought under subjugation all irrepressible and inimical kings, the sovereign established his reproachless metropolis at Kányakubja.

- 5. Of him was born the renowned of earth, Madanapála—a lion to the inimical elephant Ilápati, (king of Ilá), who engaged himself in frequent warfare, and made the trunks of his decapitated enemies dance (in the battle field).
- 6. Of him was born the celebrated prince Govindachandra, whose lotus-like feet were adored by hosts of mortal sovereigns—a prince of refulgent might, the ornament of mankind, and the disturber of the enjoyment of his enemies.

On Sunday, the 5th of the waxing moon, in the month of Pausha, of the Samvat year one thousand one hundred and sixty one, Samvat 1163, Pausha, 5th Sudi. Sunday.† Having this day bathed here at Asatika, I on the sin-destroying Yamuna. having offered libations of water to the tutelary divinities, sages, (rishis) men, animals and manes,-having worshipped the sun, the sovereign and glorious lord of all, S'178and the asylum of the universe Vásudeva,-having duly made offerings to the fire (the prince) thus addresses all the respectable inhabitants of the village of Vasabhi, in the district or circle (Pattana) of Jiyavani. This village with all its fields, and orchards of Madhuka and mangoes, together with the sky over it and the region below it, as also the power of administoring justice, the right to a tenth for every ploughshare, to a twentieth on mortgages, to royalties or shares (prastha) of corn, for beggars, justice. watch and ward, mines, aromatic reeds and gold, along with all other,-the village having on its East the village of Bandhamauni; on its West the village of Vedabhala; on its South the village of Pusani; and on its North, the village of Savahada, thus bounded on four sides-for the increase of virtue and good name of my parents and myself, and knowing life to be as impermanent as a bubble on water and the value of wealth to lie in charity and enjoyment, has been granted as a sasana for the period of the sun and the moon to the astrologer Brahmana, Ahneka, son of Kulye. and grandson of Meine, of the Bahvrich Sákhá (branch) of the Gautama clan (gotra). having Gautama, Avitatha, Angiras'a for his threefold Pravara, by Govindachandra Deva, son of the Maharaja, on the winter solstitial conjunction (of the month of Pausha and Magha) with water held in his hand, and purified by Kus'a grass.

- With folded hands this is my prayer to all future sovereigns of my and other
 dynasties, that they should never take any tribute from this villago—not even a blade
 of durba grass. Those who wish to do their duty should, obedient to the mandates
 of sages, preserve intact my gift, (as long as) the wind blows and the sun continues
 to shine.
- 2. This earth has been enjoyed by many kings, including Sagara and others. To whomsoever belongs the earth for the time being, he enjoys the fruit (of such gifts).
- Whoever robs earth, whether given by himself or others, becoming a maggot, sinks with his parents into ordure.
- 4. Both he who accepts land and he who grants it, are equally meritorious, and they dwell eternally in heaven.
 - 5. The alienator of land-grants cannot expiate his crime even by (dedicating to
- The word prabandha means both continuous action and a treatise. The latter would imply that the king composed some treatises on tactics, but the second clause would be more in keeping with the former meaning which has been adopted in the text.
- † The repetition is due to the circumstance of the date being given first in words and then in figures.
 - I Probably the name of a ghat or a village on the Yamuna.

public use) a thousand tanks, by (performing) a hundred Vájapeya rites, and by giving away in charity ten million heads of cattle.

This was written by Vijayadása, son of the Pandit S'rí Kuke, with the consent (or in the presence?) of the family priest S'rí Jáguka, the chief accountant (Mehatta-ka.)* S'rí Bráhmana, and the warder (Pratihára) S'rí Gautami.

Transcript of Inscription No. II.

- १ (सिक्त ॥ चक्कचोलाव्यनेकुष्ण)कष्णपीठलुठलारः । संरक्षः सरतारको स त्रियः (त्रेयसेऽलु) यः ॥ १ ॥ चासीद्गीतयुतियंग्रजातसापास(मालासु दियं नतासु । सामा)दिवसा(निव
- २ भूरिधाला) नामा (यमेविय) इत्युदारः ॥ १॥ तस्युते। भूकाशीनम्बयम्बयम् धाम-निर्भ निजम्। येनापारमञ्जूपारपारे यापारितं यमः॥ तस्याभू (तनया नयेक-रिककः क्रामादिषकादको
- विध्यक्षोद्धतवीरयोध)तिमिरः श्रीचन्द्रदेवे। च्यः। येनोदारतरप्रतापज्ञमिनाभ्रेषप्रजोपद्धवं श्रोसद्वाधिपुराधिराज्यससमं देविक्त(सेणार्जितम् ॥ तीर्थामि काभ्रिकुण्यिकाणरकोग्र-)
- श्रेन्द्रस्थानीयकानि परिपालयताभिगस्य । हेमातातृत्यमिनमं ददता दिलेश्या येनाक्विता वद्यमती मतम्बनुत्ताभिः ॥ तस्यात्मको मदनपाल इति चितीन्द्रचूडा(महिविवय)ते नि--
- (जगेनचन्द्रः । यसाभिषेककस्त्रोक्तिः प्रयोभिः प्रकृतितक्वितक्वास्तरस्थान्द्रः । यसाभिष्ययप्रयाणसम्य तुङ्गाचले वैसलकास्त्रकृतिस्व समास + भरस-
- (स्वक्षचीमख्छे। चूडारव्यविभिन्नतालुर्गालतस्यानाच्या)द्वासितः ग्रेषः पेषवद्याद्विय चल्तसी त्रोडे निजीनाननः ॥ तस्माद्जायत निजायतवाक्रविवश्यावद्यनवराष्ट्रग-
- (को नरेन्द्रः । सान्द्रास्ततद्रयमुचां प्रभवे। गर्वा यो) गे।विन्द्रचन्द्र इति चन्द्र इवाम्यु-राज्ञेः ॥ व स्थमप्रक्षभन्त रच्छमांकि स्पु दिचु गणानावविद्यक्षः । सङ्काभिन्वध-सुरक्षम्यक्षभ--
- (प्र)तिभटा (इव यस्य) घटा गजाः ॥

सार्यं स(ससराजयमधंमे)वितचरकः परममहारक्षभंदाराजाधिराजपरमेश्वर-धरममाचेश्वरविजभुजापार्जितनीकन्यकुलाधिपत्य

- (श्रीष)म्बदेवपादानुध्यातपरमभद्दारकमचाराजाधिराजपरमेश्वरपरममाचेश्वरत्रीमद-नवाखदेवपादानुध्यातपरमभद्दारकमचाराजाधिराजपरमेश्वर—
- १० परममाचेवरशीमद्वीविन्दचन्द्रदेवी विजयी () निवासिनी निवासनाविष च राजराष्ट्रीयुवराजमन्तिपुरीहितप्र-

I take this word to be the ancient form of the Uriya Makinti and the Bengali Mayiti, an officer whose duty is to keep accounts.

- 1878.]
- ११ तिषा

यया वि(दितमसु भ) वतां यथे।परिश्विषतपामी सजस्यस्थी ससीवस्वनदा-करी समस्याकरी समर्भाषरी समध्वास्वनवाठिकाविटपरक्षयुतिमो-

- १२ (चरपर्यन्ती सेर्धा)धयतुराधाटिवद्यदी खरीमापर्यन्ती चतुःसप्रत्यधिकैकादस्रात-संवत्यरे फाक्सने सासि खम्मपत्ते वतीयायां तिथी चक्कतोऽपि संवत् १९०४ फास्स
- १४तीरसमावासेन मन्त्रपूरी देनेन स्नाला विधियत् मन्त्र-दे(व) मुनिमनुजभूतिपढाणां स्वपैधिला तिमिरपटसपाटनपटुमस्समुख्यरे स्विमुप-स्थायी (विधिपति सन-
- १५ लग्नेसरं समस्य) चै निभवननातुर्व्वास्तदेवस्य पूर्जा विधाय पायसेन चित्रा चिर्मुजं इत्वा मातापिनेारात्मनस पृष्ययभाऽभिष्टदये काम्यपगेननाय काम्यपासारनेभु-
- १ (वप्रवराय ठकुरत्रीयोगिपावाय ठकुरत्रीखदैपुत्राय ठकुरत्रीदेवपासमधी त्राचाना यास्माभिगोकर्णकुमस्त्रापुतकरतस्रोदकपूर्वमाचन्द्राकं यावन् (मासनी-
- १० क्वत्य) प्रदत्ताविति सला यथादीयमानभागभागकरप्रविषकरप्रश्वित्तसर्वेदायानाञ्चा⇒ विभेयीभूय दाख्यथा॥

भवन्ति चात्र होकाः।

भूमिं यः प्रतिग्टकाति यस भूमिं

- १८ प्रथक्कति । अभी ती पुष्पकर्माको नियती सर्मगासिनी ॥१॥ महां भद्रासनं इर्च यराञ्चा वरवारकाः । भूमिदानस्य चिक्रानि फल्लमेतत् पुरन्दर ॥१॥ सर्वानेतान् (भाविकः पा—
- १८ र्थि) वेन्द्रान् भूये। भूये। याचते रामभदः । सामान्ये। यन्धर्ममृतुर्देपाकाक्काले काली पालनीया भवद्भः॥ २॥ वङ्गभिर्व्वसुधा भुक्ता राजभिः सगरादिभिः। (यस्य यस्य यदाभू—
- १० मिल्र) स्र तस्य तदा फल्म्॥ ॥ सुवर्षमेकं गामेकां भूमेरप्येकमङ्गलम्। चरत्रस्य-माप्रोति यावदाभूतसंख्यम्॥ ॥॥ तडागानां सच्चेणाप्यमेधमतेन च । (गवां कोडि-
- २९ प्र)दानेन भूमियको न ग्राधित ॥ ६॥ सद्कां परदक्तां वा ये। यरेत वसुभरास् । य-विद्यायां क्रमिर्भूता पिक्षिः सप मज्यति। ॥ विद्यवेशयवाचि सर्वे वसति भूमिदः।
- ११ चाक्ता चानुसमा च तान्येव नरके वसेत्॥ वारिचीनेव्यरकेषु ग्राम्बकीडर-वासिनः। क्रम्यसर्पाच जायने देव (त्रक्षसंचारिकः॥ ८॥ यानीच दणानि
- १६ पुरा) नरेन्द्र दानानि धर्का(र्थयम)स्त्रराणि । निर्काखनानप्रतिमानि तानि को नास साधुः पुनराददीत ॥ १० ॥ वाताअविश्वमनिदं वद्यथा(विपत्यनापानमावसधुरा
- २४ विष)योषभोताः । प्राणा(खुणाय)जलविन्तुत्तमा जराणान्यकः सचा परमचा परसे परकेकः याज ॥ करिकोक्तन वक्तरत्री

Translation.

- 1. Let this be auspicious. May that agitation at the commencement of his dalliance with S'ri, when her hands rolled about on the neck and shoulders of eager and lustful Vaikuntha, be to your prosperity!
- 2. When the line of protectors of the earth, born of the race of the ungenial-rayed orb (the sun), had departed to heaven, there lived one of the name of Yasovigraha, the munificent, who, in the plenitude of his effulgence, was like the sun himself.
- 3. His son was Mahichandra, whose glory, resembling the light of the moon, was spread wide by him beyond the sea.
- 4. Unto him was born a son, the king S'rí Chandradeva, the lover of polity, the discomfiter of hosts of enemies, the dispeller of the gloom of impatient, heroic warriors, by whose glorious majesty was repressed the rovolts of the subjects of the unrivalled great kingdom, of auspicious Gádhipura,* which was carned by the valour of his arms.
- 5. Repairing, as a protector, to Kás'i, Kusíka, Uttara Kos'ala, Indrasthána, and other places of pilgrimage, he marked the earth by the performance of a hundred tulá rites, in course of which he repeatedly gave to the twice-born his own weight in gold.†
- 6. His son was Madanapála: that crest-jewel of the lords of the earth flourishes as the moon of his race. By the waters, which sparkled in jars at his coronation, the earth-was washed clean of all the sinful dust of this iron age.
- 7. When he went forth to conquer, on the earth sinking under the over-powering weight of the foot-falls of his maddened and careering elephants, high as lofty mountains, the serpent Sésha, crushed as it were by it, and having its crest-jewol fractured and thrust down into its bleeding mouth, for a time hid its face in its folds.1
- 8. Erom him descended the king Govindachandra, even as the moon issued forth from the ocean. His long arms, extending like croepers, tied and checked all elephant-like upstart kingdoms, and he was the source of thick fluid-nectar-sprink-ling eloquence.§
- 9. His numerous elephants could nowhere in the three quarters find worthy tuskers that could fight with them, and so they repaired to the quarter of the wiekler
 - Ancient name of Kanauj.
- † The ceremony is a very costly one, but it is not uncommon. Within the last ten years it has been several times celebrated in Calcutta, and in course of it not only gold, but silver, rice, paddy, sesamum seed and other articles were weighed against the donor, and presented to Brahmans. The Danakhanda of Hemadri, now in course of publication in the Bibliotheca Indica, contains a full description of the details of this rite.
- ‡ It is commonly believed that certain species of serpents bear very bright jewels on their heads; S'esha, the king of serpents on whose head rests the earth, according to Pauránic cosmogony, has the largest jewel.
- § If the word gavaya be taken in its ordinary acceptation of kine, the meaning of the phrase would be "the source (whence men obtained) kine which gave thick, sweet milk."

of the thunderbolt (East) where the lord of Abhramu* (Airávata the elephant of Indra) was their only rival.

The same Govindachandra Deva, whose feet are profoundly adored by hosts of sovereigns, the highly revered,† the great king over great kings,‡ the supreme lord,§ the devout worshipper of S'iva,|| the sovereign of the three classes of kings, vis. As'rapati, Gajapati and Narapati,¶ master (Váchaspati) of all knowledge and logio, successor of the highly revered the great king over great kings, the chief lord, the devout worshipper of S'iva, S'rí Madanapála Dova, who was the successor of the highly revered, the great king over great kings, the supreme lord, the devout worshipper of S'iva, S'rí Chandra Deva, the sovereign who, by his arms, carved the happy kingdom of Kányakuhja, reigns supreme.

He commands, acquaints and enjoins the inhabitants of (?) and those who have come thereto from other places, as also kings, queens, heirs-apparent, ministers, priests, warders, (pritihára) generals, treasurers (bhándágárikus) justiciaries (akshapatolikas) physicians, astrologers, guardians of foinale apartments (or dwellers of the zenána,) envoys, and owners of elephants, horses, towns, minos, commons, and hords of cattle: Be this known unto you, that after bathing in water consecrated by mantras, after offering according to law water to mantras, gods, sages, mortals, elements and manes, after paying due adoration to the fiery light (sun) whose rays are potent in dispelling dense darkness, after worshipping the cresent-crested (S'iva), after performing pujá to Vásudeva, the preserver of the three regions, after offering oblations of frumenty and clarified butter to the partaker of butter (fire), for the promotion of virtue and fame of myself and of my mother and father, I have, by this patent, with water held in my hand and consecrated with Kusa grass, for the period of the duration of the sun and moon, bestowed on the third of the wane, in the month of Phalguna, in the year of Samvat one thousand one hundred and seventy-four, (in figures) Samvat 1174 Phalg., the two above written villages, together with their soil and waters, their iron and salt mines. their fisheries, pits and salt fields, their orchards of mango and madhuka trees, their gardens, topes, grass fields and pasturages, including everything above and below,

- Name of the mate of Airávata.
- † Paramabhattáraka. In Sanskrit dramas bhattáraka moans a king, but in ordinary language a revered personago is generally implied.
- † Mahárájádhirája equivalent to the Arabic sultán ne-salátín. The term may be split into two—Mahárája and adhirája " great king, and paramount sovereign."
- § Parama=supreme and isvara=lord or god. The epithet has been loosely rendered into Emperor in the translation of the Delhi College plate (xxvii p. 249).
- || Parama-Máhá-ísvara. In the Bouarcs inscription of Col. Stacy, it is placed in opposition to parama vaishnava, some of the princes named being parama máhes'vara, others parama vaishnava. The long á after m shows that the word is a derivative and refers to Mahes'vara or S'iva. A sectorial meaning may be objected to on the ground of the seal having the Vaisnava emblems of Garuda and conch-shell, indicating that Govinda was a Vaishnava. But the expression of equal respect for both S'iva and Vishnu is not uncommon.
- ¶ Evidently intended for some tributary kings. The Rájás of Orissa used to call themselves Gajapatis; those of Talingáná and Karnáta bore the special title of Narapati, and some of the Burmese monarchs were As'vapatis; but it is not at all likely that any of these bore allegiance to the kings of Kanauj. Vide ante xxvii, p. 24.

with their four abuttals well defined, and within their boundaries, on the Bráhman Thakkura, Devapála S'armá, son of Thakkura Udai; and grandson of Thakkura Yogi, of the Kás'ynpa clan (gotra) and Kásyapására-naidhu sept (pravara). Knowing this you should comply with his orders, and render unto him all dues, shares, rents, tributes, quadrivial tolls, &c., whatever have to be given.

On this subject are the following s'lokas:

- 1. (The same as the 4th s'loka of the first grant.)
- A conch shell, a throne, an umbrolla, choice horses, and excellent elophants, Purandara, are the royal insignia, which constitute the reward of giving away land.
- 8 Rámachandra repeatedly intreats all present and future lords of earth (to bear in mind) that this bridge of virtue (the granting of lands) is common to all sovereigns, and should be preserved by you at all times.
 - 4. (Is the same as the 2nd of the first grant).
- He who robs a gold piece (suvarna), a cow, or a finger's breadth of land, dwells in hell until the dissolution of the universe.
 - 6. (The same as the 5th of the first grant.)
 - 7. The same as the 3rd of the first grant.
- The donor of land dwells in heaven for the space of sixty thousand years;the resumer, and the abettor thereof, are doomed to abide in hell for a like period.
- 9. The resumers of lands dedicated to Gods and Bráhmans, become dwellers in arid wastes devoid of water, and dry hollows in trees, and are born as black serpents.
- 19. All the gifts of former kings are productive of virtue, wealth, and fame,—how can he, who claims the name of goodness, resume them which are to them but as emblems of vomited food?
- 11. Sovereignty is like unto clouds impelled by wind, (i. c. inconstant), worldly pleasures are sweet only for the moment, the life of man is but a drop of water at the point of a blade of grass; virtue verily is the only great friend for translation to a future world.

By the Kayastha Thakkura Shi-

1873.]

A Metrical Version of the opening Stanzas of the Prithiráj Rásau, with a critical commentary.—By F. S. Growse, M. A., B. C. S.

"Manuscripts are in general grossly incorrect; and a familiarity with the metre will frequently assist the reader in restoring the text where it has been corrupted."

Colebrook, on Sanskrit and Prakrit Poetry.

The following version of the opening Stanzas of Chand's great poem does not lay claim to any poetical merit. It simply professes to be a close and accurate reproduction of the original, so far as the difficulties of the text allow, in readable and intelligible English. Occasionally the exigencies of rhyme and metre have necessitated some slight expansion or curtailment; and in a few passages the exact turn of expression has been deliberately abandoned, either because there was a doubt about the reading, and therefore a little vagueness was preferable to what might turn out to be mistaken accuracy, or because a rigid adherence to Hindi style would have had a forced and unnatural effect, and to that extent have misrepresented the original. But throughout, the translation is line for line, not unfrequently word for word; the connection of ideas, not always easy to trace, has been carefully studied and faithfully preserved; and not a word materially affecting the sense has anywhere been either omitted or inserted.

These, it must be admitted, are rather the merits which should characterize a prose translation; and as a literal rendering of these very same stanzas has aleady appeared in the last volume of the Society's Journal, the present version might be hastily condemned as a mere work of super-erogation. The rendering to which I refer is therefore appended in a running foot-note; the words to which exception is taken as being (in my opinion) specially incorrect being printed in italics; and the text is inserted above, in order that the correspondence, or otherwise, of the one with the other may be rapidly apprehended. For other reasons it was desirable that such comparison should be made; though it may be added that the present metrical version would never have been attempted but for the opening sentence of the preface to the prose translation, which fathers upon me a retractation which I am not conscious of having made.

In my reprint of the text I have for the sake of the metre corrected the copyist's errors of spelling in many places where without such correction the lines could not possibly be scanned. It is incredible that Chand himself was guilty of these false quantities, since in one of the verses which I translate, it will be seen that he specially prides himself upon his accurate knowledge and observance of the laws of prosody. The alterations, which affect the sense, are very few in number, and are all fully explained and defended in my running commentary.

- $oldsymbol{I}$. प्रथम साटका अनंद । चादि प्रमय मय मद्यं वामीय वंदे पर्य ! सिष्टं बारन बारयं बतुमती स्टीस बरनावयं ॥ तमग्न तिष्ठति ईसं दृष्ट दश्नं सुर्नाय सिवित्रयं । थिर चर जंगन जीव चंद नमयं सबैस वरदासयं ॥ १ ॥
- Bowing low before my master, I the queen of speech entreat, And the world-supporting serpent and great Vishnu's holy feet. Then the perfect, sin-consuming god of gods that awful power, Life of man and life of nature, I the poet Chand adore.

Thus after due mention of his Guru, the poet addresses his invocation to Sarasvati, Sesh-nag, Vishnu, and Mahadeva, the first of these four divinities being clearly indicated by her title of Váni. Half of the second line is difficult, but if translated literally, would I believe stand thus, "The supporter of the weight of creation, that is, of the world," meaning Seshnág. It can scarcely be doubted that sishtam is a corruption of srishtam, created.' not of sreshtham, 'the best' or 'highest;' for the substitution of i for ri is quite according to rule, as in siála, 'a jackal' for srigála, but I know no instance of the substitution of i for re or t for th. In the third line, the words tama-quna is indicate Mahadeva, who is lord not 'of vice and of virtue,' but of the quality (qun) of darkness (tama). In siddhi-srayam the first part of the compound may mean 'success,' or may allude to the eight Siddhis, Rasollása, Tripti, Sámya, Tulyatá, Visoká, &c., the constituents of perfection; and adopting the latter view I translate by 'perfect.' In the fourth line, I have corrected the unmeaning word Chandana-mayam by the simple process of division into Chanda namayam, 'I Chand reverence.' In the first half of the line, achara should probably be read for chara; for certainly the intention is to represent the god as the life both of sentient and insentient creation.

II. वयूषा चंद। प्रथम सुसंगन्त सूख श्रुति वीय॥ सुतिसत्य जाल सिंचय र ॥

I. The prose translation:

"First reverently bowing, bowing, the poet adores the feet of the Gurus. Taking refuge at the feet of the highest, the aforder of support, the husband of the opulent Lachhi; who stands the lord of vice and of virtue, consuming the wicked, the lord of heaven, blessing with success; who is as sandal-wood to the life of living beings moving on the earth, lord of all, bestower of blessings."

II. The prose translation:

"First the very auspicious root is to be celebrated. Irrigated with the water of the truth of tradition, religion like a fair tree with one trunk sprung up, with thrice six branches rejoicing the three worlds. Leaves of various colours, leaves like mouths there were. Colour of flowers and weight of fruit it had, speech unfailing. princely. rejoicing with fragrance the sight and touch, asan tree of hope to the parrot-like poet."

सुत्त एक घर अयं अथे। ॥
विषठ साथ रिवाय विप्र ॥
वरन पत्त मृष पत्त सुर्थे। ॥
कुसुन रंग भारच सुपछ ॥
खकति चलन चनोर ॥
रस दरसन पारस रिवाय ॥
चास चसन कवि कीर ॥ १॥

II From the seed of Revelation,

Watered by Law divine,

Sprang with thrice six spreading branches

Faith, a straight and goodly pine,

Each leaf a lettered sign

Rich in fruit of lovely colour

And homed flowers of song,

Sweet to taste, to see and handle,

For the poets, pariot throng

In the first line I have divided the unknown word Sruta viya into State viya, State being the highest Revelation as distinct from Smriti, mentioned in the next line, divine Law or Tradition Viya, if allowed to stand, is of course 'seed;' but it might be better to read boya, 'to be sown,' the difference between the two words in Nagari writing being almost imperceptible. The fifth line is probably corrupt, but baran certainly means not 'colour,' but 'letters of the alphabet,' which, according to the Mimansa Philosophy are supposed to be eternal and immutable. In line 7 amer is not the familiar Persian word meaning 'a noble,' but is for amerit, 'nectar'. In the last line the word as is a little doubtful, but asan unquestionably means simply 'eating'

III. इत्ये।

प्रथम कीय सगल प्रसान । निगम संपूज्य वेद् घुर ॥ विगुण साथ चिक्र चक्का । वरन खम्मा सुप्त बर॥ लचा धर्मा उदरिय। सत्त पूखी जु चन दिशि॥ कर्मा सुप्तल उदयत । चनत सुमूत सध्य नि॥

III The prose translation

[&]quot;First having indeed proclaimed a blessing, having honoured the sacred writings, whose beginning is the Veda, whose three fold branches in all four directions are possessed of colour and leaves like letters. Religion, having sprouted out through the bank, flowered fair in all four directions are fruit, virtuous deeds springing out immortal, dwelling amidst mortals; firm as counsel of kings, or as the earth; the wind shakes it not, giving to life the flavour of nectar, the kali-yug affixes no stain to it, containing truth, wisdom, and perpetual freshness."

डुक्कैन वाय रूप नीति धति। साद् चस्तत जीवन करिय॥ कस्ति जाय न स्त्रौ कसंक दुवि। सत्त मत्त चाडति घरिय॥३॥

III. The Vedic Scriptures. God's best gift. First claim respect profound, With three-fold branches spreading wide, Each leaf a lettered sound; Its bark religion, whence the bud Of virtue forced its birth, Ripening to fruit of noble deeds, Heaven's bliss midst men on earth. Who tastes, unshaken by the blast, Firm as king's counsel, stays, Ave growing to more perfect good, Unsoiled by these foul days.

I have headed these stanzas 'Chhappai,' that being a more correct designation of them than 'Kabitt.' In the first line the word pramin is precisely identical in meaning with nigam in the following line; both are synonymes of the Veda. A strictly literal translation would be "first having taken the blessed scriptures, reverence them, the divine oracles, the original Veda." It will be noticed that the poet keeps hovering round the same idea, which he repeats in three different metres. Line four here corresponds precisely with line five of the Vathúa, and as there baran must be translated 'A letter of the alphabet.' In the last line occurs the word árhati, which I translate 'growing,' taking it to be formed from the root ridh. A Mathurá Pandit explained it by sambandh, 'connection;' in which sense chiefly as a business term, for dealings with an arthing, or 'broker,' the word is still very common.

IV. edi

भगति भूमि किय कार। वेद मिंचिय जल पूरन॥ बीय सुबंध संय मध्य। ज्ञान अकूर सर्जूरन॥ विग्क साथ संपंदिय। नाम वक्त पत्त रत्त कि।त ॥ सुकरका सुमन पुजरी। भुगति पक्का द्रव सगति॥ दुक सुभव दिन्यवृध पका रस । वट विलाभ गृन पस्तिय ॥ तद रक्ष साथ नय साम मिरा अजय विजय गुन विस्तरिय॥ ४॥

IV. The prose translation:

"Taking possession of the earth like a garden-plot; irrigating it with the fulness of the Veda as with water; placing in it good seed, upsprung the shoot of knowledge, combining branches of three qualities, with leaves of many names, red as earth. It flowered with good deeds and good thoughts, complete deliverance, union of substances. The twice-born of pure mind have experienced its flavour of perfect wisdom, a banian tree of delight, spreading abroad virtues; the branches of this excellent tree in the three worlds, unconquered, victorious, diffusing virtues."

IV. The world, a pleasant garden-plot, Watered with Vedic lore, From good seed cast into its midst

The plant of wisdom bore.

amost houghs sured and

Three great boughs spread, and the earth grew glad

At the leaves' new melody,

While flowers of virtue swelled to fruit

Of immortality.

The bird-like sage quaffed the sweet juice

Of this exquisite marvellous tree,

With its single stem and its far-spreading boughs Full of glory and victory.

In the first quatrain, the only word of any difficulty is bhugati, which I take to be equivalent to bhog. In the second occurs the phrase ratt chhiti. Here ratt is simply the past participle of the verb rang, meaning not 'red,' nor even 'coloured,' but in its secondary sense 'affected by love,' like the more common mohit, 'charmed.' The two words are parenthetical, and the most literal translation of them possible is 'earth is charmed.' The three boughs, to which such frequent reference is made, can scarcely be taken to mean the three qualities saltva, rajas, and tamas, but indicate rather that the influence of religion extends over the three worlds of earth, heaven, and hell. In line seven, I have altered susan, apparently a mere misprint, to suman, not 'good thoughts,' but 'a flower.' In the ninth line, duja might mean 'twice-born;' but it seems a more appropriate carrying out of the allegory to take it in its other well-known sense of 'a bird.'

चंद् भुजांगप्रयात।

प्रयसं भुजंगी सुधारी पष्टां। जिने नाम एक चुनंतं क्षत्रं॥ दुनी सन्भयं देवतं जीवतेसं। जिने विख् राष्टी बस्ती संव सेसं॥

- 5. चवं वेद वंभं चरी कित्ति भाषी । जिने अस्य साअस्य संसार सामी ॥ कृती भारती यास भारव्यं माथी । जिने जन पारव्यं सारव्यं साथी ॥ चवं सुक्बदेवं प्रोक्त पायं।
- 10. विजे जबूचे सर्व कुद वंस रायं ॥
 जरं क्य पंचका श्रीक्ष सारं।
 जक्षेराय कंडं दिने ग्राह कारं॥
 कर्व कास्त्रियां सुभाषा सुवहं।
 विजे बाज वानी सुवानी सुवहं॥

- 15. कियी कालिका मुख्य गाएं सुदुर्द । कियी ऐतु वंधी तिमेखप्रवंध ॥ धनं दंडमाको खलाको कविन्तं । कियी वृद्धि तारंग गंगा धरिनं ॥ खर्दे व चठटं कवी कव्य रार्थ।
- 20. जिने केवसं किति गोविन्द गायं॥
 गुदं सम्म कम्मी सक्तं चंद कम्मी।
 जिने दर्भयं दंवि सा संग सम्मी॥
 कवी किति किती सकती सुद्धिशी।
- 24. तिमं की उचिष्टी कवी चंद भण्यो॥
- V. First reverence to the serpent-king, who ordereth all things well, Whose name is told ways manifold, though one, unchangeable. Next be adored the Sovereign Lord, the god of quick and dead, Who by strong spells set fast the world on the great serpent's head.
- 5. In the four Vedas' holy texts is Hari's glory shewn, A witness to eternal truth, where only sin was known. Be Vyása third, from whom was heard the tale of the Great War, Where Krishna, first of charioteers, drove Arjun's sounding car. Fourth, Sukadev, who at the feet of king Parikshit stood.
- 10. And wrought salvation for the whole of Kuru's lordly brood. Srí Harsha, fifth, pre-eminent in arts of poesy, Who on king Nala's neck let fall the wreath of victory. Sixth Kálidás, in eloquence beyond all rivals great, Whose voice the heavenly Queen of Speech vouchsafed to modulate.
- 15. Upon whose lips great Káli's self thought it no shame to dwell, The while he framed in deathless verse King Bhoja's Chronicle.

V. The prose translation:

First be the well-adorned Bhujangi taken, whose name this one is spoken in many ways. Second be taken the god, the lord of life, who placed the universe by powerful spells on Sesh-nág. In the four Vedas by the Brahmans the glory of Hari is spoken, of whose virtue this unvirtuous world is witness. Third the Bhárati Vyása spake the Bhárath, who bore witness to the more than human charioteer. Fourth Sukadeva at the feet of Parikhit, who extolled all the kings of the race of Kuru. Fifth who placed a six fold necklace on the neck of kings also. Sixth Kálidása, fair of speech, fair of wit, whose speech is that of a poet, a master-poet, fair-speaking, was made the pure fragrance of the mouth of Kali, who firmly bound the dyke of three-fold enjoyment. Seventh, Danda-Máli's charming poem, the wave of whose wit is as the stream of Gangá. Jayadeva, eighth, poet, king of poets, who only made the song of Govinda. Take all these poets as thy spiritual guide, poet Chand, whose body is as a sacrifice inspired by Devi. The poets who have uttered praises and excellent speech, of them poet Chand has spoken highly."

Be seventh in place the jocund grace of Danda-Máli's theme, Sweeping along, full, deep and strong, like Ganga's mighty stream. Eighth Jayadeva, bard of bards, most worthy that high name,

- 20. Whose sole delight to tell aright the great god Gobind's fame. Thus each great name of elder fame I the bard Chand invoke; For as the present god inspired, those loving servants spoke. In humble phrase I dare to praise the deeds of one and all,
- 24. Who can but gather up the crumbs that from their table fall.

If this passage is genuine, and there seems no reason to doubt the fact, it is of some value in the history of Sanskrit literature as tending to determine the date of the two poets Sri Harsha and Jayadeva. Dr. Bühler assigns the former to the middle of the twelfth century, relying chiefly on the authority of Rájá Sekhara, a Jain writer of about the year 1350 A. D. This view, which is by no means in accordance with ordinary Hindu tradition, has been ably combated in the pages of the Indian Antiquary, and must now be considered as finally refuted. For though Chand may not have been a very profound critic of Sanskrit style, and may have been as regardless of chronological precision as most of his countrymen, still it is impossible that he should have committed the blunder of referring to remote antiquity a writer, who-according to Dr. Bühler's hypothesis-would have been all but, if not quite, his contemporary. Similarly in Jayadeva's case, the desire of European scholars to prune down the exaggerated figures, in which Hindus are prone to indulge, has led to error in the opposite direction. Professon Wilson concludes him to have been a disciple of the great religious reformer Rámánand, who flourished in the thirteenth or fourteenth century. This connection, so far as I can ascertain, is not warranted by any text in the Bhakta Málá, the recognized authority for the lives of the Vaishnava saints, and is totally disproved by the fact now brought to light that Jayadeva is mentioned by name by Chand, who wrote some hundred years before the time of Rámánand even.*

The metre Bhujanga prayit is a series of rhyming couplets, each line comprising four of the foot called in Sanskrit prosody Ya-gan, i. e. one short followed by two long syllables. In the twenty-four lines, as originally printed, there are as many as eighteen false quantities; but the defect in every instance is obviously the result of mere carelessness on the part of the transcriber, and has been rectified by some one of the three simple and recognized prosodiacal expedients, viz., the introduction of an anusvara, the reduplication of a consonant, or the change of the quantity of a vowel. In the first line, the word Bhujangi contains an allusion to the name of the

^{*} I have stated the argument at greater length in two letters on the subject which have appeared in the Indian Antiquary.

metre, which it is quite impossible to preserve in a translation, but primarily it denotes the serpent God, Sesh-nág; bhujanga being a common name for a serpent. Sudhári, like every other word with the same termination, has not a passive but an active signification, and means 'the good arranger;' as mantra-dhári means 'a layer down of counsel,' and rás-dhári 'a composer of dances.' It will be observed that the poet is giving a brief catalogue of all the great authors of earlier date, and places at their head the god Seshnág, the first artificer or mounties of the universe. He then passes on to the Vedas, which he represents as directly inspired by Vishnu, and thence to the Mahá-bhárat of Vyása, the Srí-Bhagavat of of Suka-deva, and so on, in each case either mentioning by name or describing the author's principal work and eulogizing his genius. Thus in the fifth line we are forbidden by the context from taking the obscure word bambham to represent the 'Brahmans' as the authors of the Veda, which has already been distinctly ascribed to Vishnu himself. I would rather consider it as a corruption of babhru, a title of that god, and couple it with the word Hari which immediately follows it.

In line eight, utta would seem to be an abbreviation for uttam, 'the best;' while Párathth is simply the Hindi form of the Sanskrit Pártha, meaning 'the son of Prithá,' a very familiar name of Arjun, the great hero of the Mahá-bhárat. In lines nine and ten, the reference is to the Srí Bhágavat, which was recited by Sukadeva to king Paríkshit when at the point of death, as the best means for procuring the 'salvation' (uddhúra) of his soul.

In the following couplet, I have corrected the unmeaning word shaddha to suddha. The allusion is to Sri Harsha's famous poem, the Naishadha, which narrates in twenty books the adventures of the hero Nala, king of Nishadha, and concludes with the description of the Svayam-vara, where Damayanti in token that she had selected him for her husband 'dropped upon his neck the wreath of flowers.'

Lines thirteen to sixteen are eulogistic of the great poet Kálidása, to whom Chand ascribes, not with perfect accuracy, the composition of the Bhoja-prabandha, a work in mixed verse and prose.* A literal translation of line fourteen would be "whose voice Sarasvati made a charming voice," vág being not 'speech' but the 'queen of speech;' and váni not 'a poet' but 'voice.' In line fifteen, vásam is not 'fragrance,' but 'an abode;' and in line sixteen the words setu bandhyau mean simply 'composed,' having been selected with alliterative allusion to the prabandha which forms part of the title of the work under mention. It may be noted upon lines seventeen and eighteen, that Danda-máli's great work, the Dasa-Ku-

• The prose frame-work is known to have been composed by Ballála Misra, but many of the peotical extracts may with great probability be ascribed to Kálidás.

mara-Charita, has still less claim than the Bhoja-prabandha to be considered a poem; since unlike most Sanskrit literature it is entirely in prose. The style, however, is sufficiently elaborate to make it ordinarily included among the Kavyas.

In line twenty, an alteration required by the metre is equally essential for the sense: kitti, with the last syllable long, being when so spelt the past participle of the word karná, 'to make,' must be corrected to kitti, with the last syllable short, a corruption of kirti, 'fame.' Gáyam also should be translated as the verb 'sung,' rather than as equivalent to gita, 'a song.'

In the twenty-second line, habbi cannot possibly be taken as a derivative from the root hu, 'to sacrifice;' it is far more natural to connect it with háva, 'love and dalliance.' In the last line, I take uchishti as a substitute for uchchhishta, corresponding to the Hindi jhuthá, 'the fragments of a feast.'

VI. दोशा।

जित्र चंद इंदच वयन। सुनत सु जंपिय नारि। तन पविच पावन कविय। अकृति चनुठ उधारि॥ इ॥

VI. Hearing Chand rate his art so low,
His lovely consort cries:
O pure and all unblemished bard,
Skilled in rare harmonies.

Here uchisht must of course be taken, as at the end of the last stanza, to denote something utterly low and vile. In the third line tan pavitra is rather 'pure of body' than 'purifier of the body,' and pávan, with precisely the same meaning, is added simply for the sake of emphasis.

VII. च्या

करें कंति सम कंत। तम पावन वड कविय।
तंत संत उचार। देवि द्रिष्य मिन्न दिव्य ॥
तंत वीर उपंत। रंग राजन सुप दाईय।
वास्त केस प्रत्यं। स्टर्ग उदिर कविताईय॥

VI. The prose translation:

"The speech in verse of Chand, excellent, hearing him utter, his wife says, Purifier of the body, O poet, uttering excellent speech."

VII. The prose translation:

"Saith the wife to her husband: Purifier of offspring, great poet, uttering spells and charms, like an oblation offered to Devi, hero of spells, very terrible, giving pleasure to kings by thy poetry: the childish sports one by one of the gods having extelled in thy poems, having uttered unchecked speech, from which to me comes wisdom, that word which is the visible form of Brahm, why should not the best of poets speak it for

खबलंब जनति जनार निर्देश निर्माण के निर्देश के सम्बद्ध के प्राप्त करें। को जिल्ला के विद्याल करें। को जिल्ला करियन करें। का

VII. Nay, good my Lord, thus quoth his spouse,
Great bard, unblemished elf,
Whose prayers and spells have power to win
The love of Heaven itself,
Hierophant of mystic lore,
Charm of the courtly throng,
Like to a child in untaught play
Lisping divinest song;
In faith pronounce one holy name
(For faith and love make wise),
'Tis Brahma's self; no dregs of eld
Deem then thy melodies.

There can be no question as to the meaning which the first line is intended to convey, but it seems impossible grammatically to extract that meaning from it, if the word sama be retained. I have altered it to mama. In the second line also, I have made a change by substituting tan for tant; it now corresponds precisely with the third line of the preceding doha; and a repetition of the kind, after a change of metre, is a very favorite artifice with Hindi poets. The erroneous reading of tant is due to its occurring at the commencement of the very next line, where it caught the copyist's eye. In the third quatrain, I have introduced two emendations; first by combining ko and vid into one word kovid, 'wise;' and secondly, by joining kabiya with the following negative, and so converting it into the plural form kabiyan. The words habbiya and uchisht have already been commented upon.

VIII. व्या चंद वाकां।

सम विनता वर वंदि । जंद जंपिय कोमल कल । सबद ब्रह्म रूप सिन । खपर पावन कि खमल ॥ जिस्तत सबद निष्टि क्य । रेप खाकार ब्रह्म निष्टि । स्वक्त ख्याच खपार। पार पाव न चयपूर मिं ॥ तिष्टि सबद ब्रह्म रचना करें। गुद प्रसाद सरमें प्रस्ता । ज्यापि सु क्वति चुकी जुगति । तो कमलवदनि कवितम एसन ॥ ०॥

VIII. The prose translation:

"To his wife saith the bard Chand, muttering soft and low, that true word of Brahm, purifier of all others, itself pure, that word which has no form, stroke, letter, or colour, unshaken, unfathomable, boundless, purifier of all things in the three worlds, that word of Brahma let me expound, the glory of the Gurus, pleasing to Sarasvati, if in the arrangement of my phrases I should succeed, it will be pleasing to thee, O lotus-faced one."

With reverence to his dearest spouse
Quoth Chand in accents mild:
That holy name of God most high,
Pure, infinite, undefiled,
Beyond the compass of all shape,
Form, stroke, or lettered sign,
Fathomicss, indivisible,
That no sphere can confine,
Hymned I that name, by my lord's help
And Sarasvati's grace,
Jeers still would mock my faultering style,
O Queen of the lotus face.

In the first line, I have allowed the word sam to stand, thinking it possible that it might be intended to represent the Sanskrit swa. The combination barbandi would seem to be a misprint; though it is impossible to say, as it is omitted altogether from the prose translation; obviously it consists of two distinct words bar 'excellent' and bandi, 'reverencing.' In line seven, akal is not 'unshaken,' but 'without parts,' that is 'indivisible.' The next line literally translated would be 'that can find no limit in the three worlds;' पावन being divided into पाव न. In the eighth line, prasád is not in opposition to rachná, but the words are parenthetical, and the construction expressed in full would be Guruke prasád se, aur yadi Sarasvati prasann ho. In the eleventh line, for chukaun with u short, meaning 'to complete,' I think it would be better to read the same word with ú long, meaning 'to fail.'

IX. इपे। चंद स्ती वाकां।

तुम वानो वर वंद । नाम देखंत विसन्त मिता ॥
चंद भंग गुन रहित । कंठ की मार काय कात ॥
वृधितरंग सम गंग । उकति उचार चित्रय कन्छ ॥
सुनर सुनत विदसंत । मंत जनु वस्य करन वन्छ ॥
चानार भूप प्रयिराज पक्ष । राज सुन तिन समन्ति ॥
वीराधिवीर सामंत सव । तिन सु मण्ड चच्चो कहि ॥ ८॥

IX. O reverent and most pure-souled bard, Versed in all rhythmic law,

IX. The prose translation:

"Thou art the poet, the excellent bard, gazing on the heavens with unclouded intellect, skilful in the arrangement of metros, having made the song of the peacock youth. The wave of thy wit is like Gangá, uttering speech immortal, soft, good men hearing it are rejoiced, it subdues like a spell of might. The incarnation king Prithiráj the lord, who maintained the happiness of his kingdom, hero, chief of heroes, and all his paladins, of them speak a good word."

Who lisped in numbers as a babe,
Numbers that knew no flaw,
Like Gangá's stream, on pours thy song
In rich mellifluous flood,
A spell of might that all confess,
But most the wise and good;
The incarnate god, who rules the world,
King Prithiráj the Great,
Of lordly chieftains lordlier lord,
Be it thine to celebrate.

The word nág which occurs in the second line, is one that bears many meanings, but the context shews that in this passage it must be interpreted in its technical sense of 'the art of prosody.' A literal rendering of the next two lines would be 'whose verses are without any faults who in child-hood made poems.' I fail to discover any possible allusion to the Kumárasambhava. In the sixth line aniya kal are 'sweet strains,' without any reference to 'immortality.'

X. इपे। चंद वाकां।

गनम्बनी प्रति चंद । चंद को सम् उचारिय ॥
सनचरनी रचने छी । सुरन चानर रच चारिय ॥
वंक नयन नयना छ । प्रानवक्षभ सुबदाईय ॥
तक चान निम्न प्रचित्र । गनरिपूजा फल पाइय ॥
सर चादि चंत किना जिते । तिन चनंत निम्मत किय ॥
चनेक पंच तिन नरन नत । यो उच्छ सितमें लिखिय ॥ १० ॥

X. Unto his fair and stately dame
Quoth Chand in loving wise:
Dear charmer, clinging vine of love,
Foretaste of Paradise,
With girlish eyes of witching glance,
My queen, my soul's delight,
Noting all faults but knowing none,
Heaven's rich-dowered favourite;
List while I tell in faltering tones

How infinite a throng,

X. The prose translation:

"To her of the elephant gait, Chand singing a pleasant rhyme said, Ravisher of the soul, tendril of enjoyment, possessing the fragrance of the ocean of the gods, thou of the glancing eye, in the flower of thy youth, beloved of my soul, giver of bliss, wife, free from all evil qualities, thou who hast obtained the fruit of the worship of Gauri, as many poems as there have been from first to last, consider how endless a string there is of them, the description of this matter is in many books, thus having taken in the best counsel."

Of diverse talents, diverse theme, Are the great lords of song.

In this passage the only line of any difficulty is the seventh, which I translate 'faultless, observant of faults;' omitting the first word garu, which may either represent garv, 'pride,' or be a mis-reading for guru. A literal rendering of the last quatrain would be 'from first to last what poems there have been, their endless (varieties of) style and theme I tell. Countless are the books: now gather from my poor wit this attempt to describe them.'

XI. इंद पबरी।

प्रनम्य प्रथम मन चाहि देव।

ॐकार सबद जिन करि चहेव॥

विरकार मध्य सकार कीन।

मनसा विलास सह फल फलीन॥

चयानह तेज चयपुर निवास।

सुर सुरम भूमि नर नाम भास॥

पुनि बचारूप बचा उचारि।

कथि चतुर वेद प्रभु तत्त सार।

वरनया चादि करता चलेष।

मृन रहित मुनन नह रूप रेव॥

XI. First I adore the one primeval Lord,

Who breathed the unutterable, eternal word;

Who out of formless chaos formed the earth,

And all creation, as he willed, had birth.

Through the three spheres his three-fold glory sped.

Fiends, gods and men—earth, heaven and hell o'erspread.

Then the supreme, in Brahma's form revealed,

By the four Vedas heaven's closed gate unsealed.

How sing the great creator, uncreate,

Passionless, formless, aye unchanged in state:

And so on for the remainder of a long paragraph; which, as it contains nothing of special difficulty, has already been adequately translated, and therefore need not be repeated. It does not advance very far in the promised poetical catalogue, for after extelling the divine author of the

XI. The prose translation:

"First reverencing my first of gods, who uttered the imperishable word Om, who made the formed out of the formless, the will of his mind blossomed and bore fruit, the sheen of the three qualities, inhabiting the three worlds, shining on gods in heaven, men on earth, serpents in hell. Then in the poem of Brahma leaving the Brahma-egg, the lord, the essence of truth, said the four Vedas, the creator uttered them unwritten, without qualities, having neither form nor line.

Vedas, it just mentions by name the Puránas, the Rámáyana and the five Mahá-kávyas; when the poet is stopped by his wife, who desires to have the Puránas enumerated more in detail. In the seventh line, I prefer the alternative reading Bráhmá uchári to Brahmánda chári, which the editor has adopted; and I translate 'then spake Brahma, the visible form of Brahm,' which appears to me a very simple and intelligible form of expression.

Before concluding this article, it may be interesting to adduce a specimen of a genuine native commentary on Chand: accordingly, I append a paraphrase of the first four lines of invocation, written by Pandit Mákhan Misr, a Sárasvat Bráhman, resident in Mathurá, who has the largest library of Sanskrit MSS., and is one of the best-read scholars in that city of Sanskritists.

ग्राटक।

The above is a good illustration of the extreme difficulty which really learned Hindus, whether they come from the east or the west of India, find at the present day in understanding their own vernacular in its earliest form. Their suggestions as to the train of ideas, traditional usage, &c., are often valuable; but their etymological explanation of particular words is frequently of the wildest and always requires confirmation. Hence the English editor of Chand must in the main depend on his own resources and stand or fall by himself.

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The Initial Coinage of Bengal under the early Muhammadan Conquerors. Part II.—By E. Thomas, F. R. S.

(Continued from Journal, Vol. XXXVI, 1867, p. 73.)

The discovery of an undisturbed hoard of no less than 13,500 coins in Koch Bihár, inhumed some five centuries since, recently claimed attention both from the number and importance of its representative specimens, which so effectively illustrated the history of the kingdom of Bengal for a consecutive period of some 107 years.* The earliest date thus accorded towards the purely Initial Coinage of the country under its newly-installed Muslim administrators did not reach higher than the reign of the Empress Raziyah, A.H. 634-637 (A.D. 1236-1239), or more than 34 years after the first entry of the adventurous Khilji and Turki troops into the recognized Hindú capital of the lower Ganges. † A still more recent discovery of a comparatively poor man's cache, in the fort of Bihar, I elucidates an earlier chapter of the local annals: and though the contents of the earthen vessel in this case are limited in number to a total of 37 pieces, and restricted in their dates to a term of 13 years, they, in some respects, compete advantageously with the previously-recovered unexampled store, in the value of their contributions to the obscure records of the Gangetic Delta, and in priority of date bring us more than 20 years nearer to the first occupation of Bengal by Muhammad Bakhtyár Khilji in 600 A.H. As in the larger and almost regal treasure trove of Koch Bihár, the specimens in the present instance prove to be essentially of home or indigenous fabric. With the exception of a single northern piece of the supreme Sultan of India, they are one and all the produce of the mints of Bengal proper, and mark with singular fidelity the varied incidents of the alternate rise and fall of the provincial governors during the unsettled relations existing between suzerain and vassal from A.H. 614 to 627, when Altamsh came into real and effectual possession of the south-eastern portion of his Empire.

- * Journ. R. A. S. (N.s.) Vol. II., 1866, p. 145. Reprinted in the Journal of the Asiatic Society of Bengal, vol. XXXVI, 1867, p. 1.
- + The name of Nudden, ज्याद्वाप, Navadolpa, the "new island" (converted into it's the Muslims), would seem to imply a southerly movement, in concert with the silt of the Ganges, of the seat of Government down to the comparatively modern occupation of this site, on the abandonment of the successive traditional capitals of earlier dynastics.
- ‡ I have no information as to the exact circumstances of the discovery of this small hoard, beyond the general intimation that it was secured by Mr. A. M. Broadley, in or near the Fort of Bihár. The coins have now become the property of Colonel Guthrie, who had already contributed the materials for my earlier notice of the Initial Coinage of Bougal.

One of the most instructive facts disclosed by these few pieces is, that the rich and comparatively undisturbed territory of Bengal felt the want of a supply of silver money long before a similar demand arose in the harassed provinces of the North-West. The southern coins date, as far as can be seen, some nine years prior to Altamsh earliest effort at a silver coinage in his northern dominions; and even Raziyah's silver money of deferred date bears every token of exclusive manufacture in the subordinate Lak'hnautí mint.

I have already quoted the testimony of Minháj i Siráj, to the effect, that on the first conquest of Bengal by the Muslims, they found no metallic or other circulating media of exchange except that supplied by cowries;* even the compromise of the mixed silver and copper jitals of the various Hindú dynasties of the central Rájpút tribes was unknown in the sea-board marts of the south.

The chronicles of the proximate kingdom of Orisá, whose boundaries touched, if they did not often trench, upon the ancient kingdom of Gaur,† explain how so infinitesimal and largely distributed a currency was able to supply the wants of so rich and essentially commercial a population. It would appear, from the official records preserved in the Temple at Púri, that although there was no silver money in use, gold in convenient weights, if not in the form of absolute coin,‡ was freely interchangeable with the more bulky heaps of cowries. In these same official palm-leaf documents we find the powerful king of Orisá, Anang Bhím Deo (A.D. 1174-1201), describing the geographical limits of his kingdom, specifying, with close exactitude, its now proved superficial area (39,407 square miles); and adding that, as the revenues of his predecessors of the Kesarí line had amounted, with a more limited extent of territory, to 15,00,000 marks of gold, so his own added boundaries had raised the State income to 35,00,000 marks. Mr. Stirling (our most trusted revenue authority), relying upon still-extant local

J.R.A.S. (N. S.) II., p. 148. See also Hamilton's Hindustan, i., 40.

[‡] On the above occasion, likewise, a new coin and seal were struck by the Rájá's orders, with the titles which are used to this day by the Khurdah Rájás, who claim to represent the majesty of this once powerful race. They run this: Vira Sri Gajapati, Gauréswara, etc. "The illustrious Hero, the Gajapati (Lord of Elephants), sovereign of Gaura (Bengal), Supreme Monarch over the rulers of the tribes of Utkalá, Karnátá, and the nine forts," etc. Stirling, As. Res. xv., p. 272.

tradition, defined the mark at 5 máshas' weight; while Dr. Hunter, under later and more vague native inspiration, pronounces it to be $\frac{1}{4}$ of a karishá, which measure may be assumed to represent the local pronunciation of the old widely-spread karsha of Manu, corresponding with the normal weight of the gold suvarna, i. e. 80 ratis. Taking the rati at 1.75 grains, this will make Mr. Stirling's return amount to 43.75 grains $(5 \times 5 = 25; 25 \times 1.75 = 43.75)$ per mark; whereas Dr. Hunter's estimate, under the same figures, would only produce 35 grains $(140 \div 4 = 35)$; but, as he assumes the modern karishá to be equal to "one Tolah or one Rupee" of our modern system,—the amount of which however he does not further define $\frac{1}{2}$,—and taking the 180 grain total as the test, $\frac{1}{2}$ the result is not far removed from Mr. Stirling's earlier estimate under the old régime;—producing, in effect, a return of 45 grains for the mark $(180 \div 4 = 45)$. But, singular to say, if we revert to the more ancient standard of the

- * Asiatic Researches, xv., 271. Mr. Stirling, however, seemed to imagine that the sum named for the total revenues, as tested by this estimate, was too high; but later investigations fully support the reasonable measure of the king's boast.
 - † J.R.A.S., II., pp. 169, 170. Chronicles of the Pathán Kings, p. 221.
- ‡ "Orissa," a continuation of the "Annals of Rural Bengul," (London, Smith and Elder, 1872) i., pp. 316, 317. Dr. Hunter, like myself, has endeavoured to make his antiquarian researches instructive in their application to the defects of our own government in India, consequent upon the too frequent disregard of the superior local knowledge and hereditary instincts of the races we are appointed to rule over.

After enumerating the ascertained totals of the revenue of the province at various periods, the author goes on to say, " From time immemorial Orissa, like some other parts of India, has used a local currency of couries. When the province passed into our hands in 1803, the public accounts were kept and the revenue was paid in these little shells." We "however stipulated that the landholders should henceforth pay their land-tax in silver, and fixed the rate of exchange at 5120 couries to the rupce." (In 1804, the official exchange was 5120, and the practical rate of exchange from 6460 to 7680.) " Had our first administrators contented themselves with taking payment in silver at the current rate of the cowric exchange, the Orissa land-tax would now have been double what it is at present. But had they resolved to collect it at a grain valuation, according to Akbar's wise policy, it would now be more than double; for the prices of food have rather more than doubled since 1804. The system of paying the land-tax by a grain valuation appears to me to be the best means of giving stability to the Indian revenues."-Orissa. ii., 172. Dr. Hunter had not seen my notice of "The Revenues of the Mughal Empire" (Trübner, 1872) when this was written. I had equally appreciated the equity and suitableness of the system of estimate by agricultural produce, which had come down to Akbar's time from the carliest dawn of the civilization of the nation at large; but I had to condemn Akbar for introducing a new element in the shape of a settlement to be paid in silver, on the average of the prices of previous years—an assessment he hoped, in defiance of the proverbial uncertainty of Indian seasons, to make immutable; furnishing, in effect, the leading idea we so unwisely followed in that deplorable measure, Lord Cornwallis's " Permanent Settlement of Bengal,"

[&]amp; Prinsep's Essays, U.T., p. 7.

sateraktika, or 100-rati* weight,—a metric division which was reproduced and reaffirmed in the authorized tankah of the Pathán dynasty, and to which we have to allow a theoretical weight of 175 grains,—Dr. Hunter's ½ toláh will come out, to the exact second place of decimals, of the 43.75 (175 ÷ 4 = 43.75), obtained from Mr. Stirling's data.

The determination of the true weight of the rati has done much both to facilitate and give authority to the comparison of the ultimately divergent standards of the ethnic kingdoms of India. Having discovered the guiding unit, all other calculations become simple, and present singularly convincing results, notwithstanding that the basis of all these estimates rests upon so erratic a test as the growth of the seed of the Gunjá creeper (Abrus precatorius), under the varied incidents of soil and climate. Nevertheless, this small compact grain, checked in early times by other products of nature, is seen to have had the remarkable faculty of securing a uniform average throughout the entire continent of India, which only came to be disturbed when monarchs, like Sher Sháh and Akbar, in their vanity, raised the weight of the coinage without any reference to the number of ratis inherited from Hindú sources as the given standard, officially recognized in the old, but altogether disregarded and left undefined in the reformed Muhammadan mintages.

I may as well take this opportunity of disposing of the other technical questions bearing upon the general subject; and, without recapitulating the investigations elsewhere given at large, I may state generally, that I understand the rati to have been 1.75 grains, the 100 rati piece-reproduced in the ordinary Dihlí tankah-175 grains. The Rájpút jital, composed of mixed silver and copper, preserved in the early Dihlí currencies of the Muslims, is 1 in value of the 1.75 grain silver coin; but the number of jitals in any given composite piece was dependent upon the proportional amount of the silver added to the ruling copper basis. The kání, like the jital is 3 of the tankah; but the kani is found to be the practical as well as the theoretical divisor, applicable alike to land and other measures, preserving its more special identity in the southern peninsula. Both terms have now been found in conjunction on a single piece of metropolitan fabric, where the jital is authoritatively declared to be of the value of one kání.† In more advanced days under the Pathans, immense quantities of pieces were coined to meet the current exchange

^{*} Chronicles of Pathán Kings, pp. 3, 167, 223, 224 (note). Dr. A. Weber, in the Zeitchrift for 1861, p. 139, cites the parallel designation of Sata Krishnala, from the test of the Black Yajur Veda (circa 800 B.C.). The commentator uses the local name above quoted.

[†] Numismatic Chronicle (s.s.) iv., p. 40, et seqq. J.R.A.S. (s.s.), II., pp. 150, 168, 168. Chronicles of the Pathán Kings of Dehli, pp. 161, 252.

answering to $\frac{1}{6\pi}$ or $\frac{1}{6}$ of the tankah; and under Muhammad Tughluq, amid other useful breaks in the too-uniform descending scale of the small change, a new division was introduced in the form of a $\frac{1}{6\pi}$ or six-kání piece, which subsequently became better known as the black tánkah.*

It would appear that the normal or conventional rate of exchange of the precious metals mechanically accepted in India from the earliest times was as silver to gold 8: 1; copper to silver 64: 1. Of course these rates were constantly liable to fluctuation.† Indeed, we can trace the effect of the influx of the gold of the Dak'hin, after its conquest, in the fall of that metal, evidenced by the obvious readjustment of the weights of the gold and silver coinage at the Imperial scat of Government. But the copper rate must have had a very extended lease of immutability, as this ratio of 64: 1 was maintained from the most primitive ages up to the time of Sikandar Lodi (A.D. 1488-1517).

As regards the application of these data to the examples specially under review, it would seem that the Bengal silver coinage was, from the first, deficient in weight in reference to the corresponding issues of the Dihlí mint; but the Dihlí silver coins were avowedly designed to fall in with the concurrent gold pieces of identical weight, and of full standard in metal: whereas we must suppose that the Lak'hnautí silver pieces, in introducing a new element, were graduated to exchange in even sums against the extant gold currency of Bengal and Orisá. Now the gold marh weighed, as we have seen, 43.75 grains, which, with gold as 1 to 8 of silver, would require 350 grains of the latter metal as its equivalent, or two 175 grain tankahs, reconciling alike the fours of the Hindú ideal, with the fives and tens of Muslim predilection; but as there is reason to believe that the local gold was not refined up to a high state of purity, this defective standard may readily account for the corresponding reduction of a few grains on the full total of the silver pieces, equally as it may have justified the acceptance of a lower touch in the silver itself.

Later in point of time, under Bahádur Sháh (710-730 A.H.), the progressive fall in the value of gold is more definitively marked by the diminution of the weight of the silver piece to the uniform standard of 166 grains, in contrast to the 169 grains which are preserved in some of the primary issues here described (Nos. 6, 7).

- * Pathán Chronicles, coin No. 207, p. 252. See also pp. 218, 219. I was mistaken in my first impression that the Bengal tankahs themselves might have a claim to this obnoxious designation. J.R.A.S., II, 160.
- † In Akbur's time, even, the progressive alteration in the value of gold, since so much accelerated, had only reached the proportion of 94: 1. Chronicles, p. 424. J.R.A.S., II., p. 63.
 - ‡ Pathan Chronicles, p. 285. In my previous article in this Journal, I was led by

The central figure in the historical tableau, illustrated by these introductory coinages, stands prominently to the front in the person of Ghiyás-ud-dín 'Iwaz—an outline of whose career I now append.

Ghiyás-ud-dín 'Iwaz bin Al-Husain.

Husam-ud-dín 'Iwaz Khiljí, a native of Ghor in Afghánistán, on joining Muhammad Bakhtyár Khiljí in Bengal, was entrusted by that commander with the charge of the district of Gangautrí.* He was afterwards promoted to the important military division of Deokot,† by Quṭb-ud-dín Aibak's representative commissioner in the South-east, and with his aid eventually defeated Muhammad Sherán and the other confederated Khiljí chiefs.‡ On

Ibn Batátah's indiscriminate use of the terms "Dirhams and Dínárs," in their local application in Bengal, to suppose that his definition of coin exchanges referred to the relative values of gold and silver, and that it in so far supported my estimate of 1:8 (J.R.A.S., II., p. 61, note 1). I now find that towards the close of Muhammad bin Tughluq's reign, the exchange had come for the moment to be 1:10 (Chronicles, p. 227), in lieu of the ordinary 1:8. The entire difficulty of the obscure passage in the Journal of the African Voyager has, however, been set at rest by the more comprehensive tables of values furnished by the Egyptian traveller Shaikh Muhárak Anbátí (Notices et Extraits, xiii., 51), which show that the dinár of silver (i.e. the tankah) was equal to 8 dirhams (hasht-káni). See also Elliot's Historiaus, iii., pp. 577, 582.

J.R.A.S. (N.S.), 11., p. 157. The new and unworn pieces in the Koch Bihár trouvaille averaged 166 grains; and the earlier issues, of 188, 189 grains, found with them, had generally been reduced in weight to correspond with the later official standard.

- * Variants كنكوري كنكوري بي كنكوري كنكوري بي . Text, p. 158, and MSS. I have preserved Stewart's version of the name in my text, but the site of Gangaulti has not been identified. There is a town called Gurguri (24° 23'; 86° 55') on the line of country between Bihár and Nágor, but it is not known to have been a place of any mark. There is also a celebrated fort of high antiquity on the same line of communication, named Gídor (24° 53'; 86° 55'), which may have served as an outpost of the Bihár head quarters.
- † Deokot (lat. 25° 18'; long. 88° 31'), the chief place in Gangarámpúr (district of Dínájpúr), is now known by the name of Damdamá. Hamilton states that "it received its present appellation from its having been a military station during the early Muhammadan Government" (p. 50). Muhammad Bakhtyár, after his first success against the King of Bengal at Nadiyá (that 23° 25'; long. 88° 22'), contented himself with destroying that town, and withdrew his troops nearer to his base of communications, to a position about 90 miles to the northward, somewhere about the site of the future Lak'hnautí, Deokot again being some 50 miles N.N.E.

Minháj i Siráj, in describing Lak'hnautí, at a later date (641 A.n.), mentions that the province lay on both sides of the Ganges, but that the city of Lak'hnautí proper was situated on the western bank. The author adds, that an embankment or causeway extended for a distance of ten days' journey through the capital from Deokot to Nágor in Bírbhúm, (lat. 23° 56'; long. 87° 22').—Stewart's Bengal, p. 57. Persian text of Tabaqát-i Náçirí, pp. 161, 162, 243. Kín-i-Akbarí, ii. 14. Elliot's Historians, ii., p. 318, iii. p. 112. Rennell's Map, p. 55. Wilford, As. Res. ix., p. 72.

1 The subjoined curious notice of the distribution of the boundaries of the kingdom of

the definite appointment of 'Alí Mardán Khiljí to the kingdom of Bengal by Qutb-ud-din Aibak, he paid his devoirs to the new Vicercy by meeting him on the Kúsi, and accompanied him to Deokot, where he was formally installed in power. When Qutb-ud-din died at Lahor, in 607 A.H., 'Ali Mardán assumed independence under the title of 'Alá-ud-dín; but after a reign of about two years, he was slain by the Khiljí nobles, and Husámud-din was thereupon elected in his stead (608 A.H.). History is silent as to when he first arrogated kingly state, and merely records Shams-ud-din Altamsh's expedition against him in 622 A.H., with the object of enforcing his allegiance to the Imperial crown, when, after some doubtful successes, peace was established on the surrender of 38 elephants, the payment of 80 laks [of tankahs?], and the distinct recognition of Altamsh's suzerainty in the public prayers, with the superscription of his titles on the local coinage. The Emperor, on his return towards Dihlí, made over the government of Bihár to 'Alá-ud-dín Jání, who, however, was not long left undisturbed; for the Southern potentate speedily re-annexed that section of his former

Bengal shortly before the Muhammadan conquest has been preserved in Hamiltons's 'Hindustan.' The compiler does not give his specific authority.

- "During the Adisur dynasty, the following are said to have been the ancient geographical divisions of Bengal. Gaur was the capital, forming the centre division, and surrounded by five great provinces.
- "1. Barendra, bounded by the Mahananda on the west; by the Padma, or great branch of the Ganges, on the south; by the Kortoya on the east; and by adjacent governments on the north.
- "2. Bangga, or the territory east from the Kortoya towards the Brahmaputra. The capital of Bengal, both before and afterwards, having long been near Dacca in the province of Bangga, the name is said to have been communicated to the whole.
- "3. Bagri, or the Delta, called also Dwipa, or the island, bounded on the one side by the Padma, or great branch of the Ganges; on another by the sea; and on the third by the Hugli river, or Bhagirathi.
- "4. Rarli, bounded by the Hugli and the Padma on the north and east, and by adjacent kingdoms on the west and south.
- "5. Maithila, bounded by the Mahananda and Gaur on the east; the Hugli or Bhagirathi on the south; and by adjacent countries on the north and west."
- "Bollal Sen, the successor of Adisur, is said to have resided partly at Gaur, but chiefly at Bikrampur, eight miles south-east of Dacca." Bollal Sen was succeeded by Lakshmana Sen, who was defeated by Muhammad Bakhtyár. The author continues, "it is possible that the Raja only retired to his remote capital, Bikrampur, near Dháká, where there still resides a family possessing considerable estates, who pretend to be his descendants. We also find that Soonergong, in the vicinity of Bikrampur, continued to be a place of refuge to the Gaur malcontents, and was not finally subjugated until long after the overthrow of Rájá Lakshmana."—Hamilton's Hindustan (1820) i., p. 114.
- و چون او [صحمد شيران]. مهتر امراي خلي برد همگنان اورا Text, p. 158.—پيدر اقطاع خود مي بود Stewart's Bengal, p. 51. Elliot's Historians, ii., p. 815.

dominions,—an aggression which was met, in A.H. 624, by the advance of Náçir-ud-dín Mahmúd, the eldest son of Altamsh, in force, who, in the absence of Ghiyás-ud-dín 'Iwaz on distant enterprises, succeeded in obtaining possession of the new seat of government. In the subsequent engagement, the Bengal army was defeated, and Ghiyás-ud-dín killed, after a reign estimated by the local annalist at 12 years.*

This is all the information we are able to gather from the incidental biographical notices furnished by our sole authority, Minháj i Siráj, that most intelligent employé of the rulers of Dihlí, and welcome visitor at the Court of Lak'hnautí in A.H. 641, where he saw and appreciated the material undertakings of this self-made king, whose memory he lauds enthusiastically. A tribute Altamsh had virtually anticipated, when he was at last permitted to behold the glories of his adversaries' capital, in 627 A.H., and then conceded the tardy justice of decreeing, that in virtue of his good works, Ghiyás-ud-dín 'Iwaz should, in his grave; be endowed with that coveted title of Sulján, which had been denied to him while living.

We have now to examine how far the recently discovered coins will fill in this defective historical outline.

Coins struck in the name of Altamsh, in Bengal.

No. 1. Silver. Size, 7½. Weight, 168 grains. Unique, in this date.

Pl. x. fig. 1. A.H. 614.

OBVERSE. REVERSE.

السلطان المعظم المعطم المعطم المعطم المعطم المعطم المعطم المعطم المعلم ال

- * Allowing 'Alí Mardán from 607—8 to 609—10, this leaves an interval up to 612 during which Husám-ud'dín 'Iwaz was content to remain head of the Khiljí oligarchy and local governor.
- † Tabaqát-i Náçirí, Text, p. 163. Mr. Blochmann has an interesting paper, in the September number of the Indian Antiquary (p. 259), on Muhammadan Titles. Among other questions discussed is the derivation and early application of the title of Sultan. The author remarks that "the first clear case of Sulfán having been used as a title belongs to the time of Rukn-ud-daulah, deputy over Fárs, under the Khalífah Al Mutf billah," A.R. 338, or A.D. 949. MM. Oppert et Ménant were under the impression that they had discovered the title so early as the time of Sargon, who, in his grand inscription at Khorsábád, is said to speak of Subaco as "Sulfán, or Sultán d'Egypte."—Journal Asiatique, 1863, p. 9, and text, p. 3. Commentary, 1864, p. 10. Some doubt has, however, since been thrown upon this identification, as the designation reads optionally, if not preferably,

The date of A.H. 614, this earliest numismatic record contributed by the Bengal mints, is further remarkable as the epoch of Altamsh's final assertion of supremacy on the defeat of his last powerful competitor in Hindústán, Nácir-ud-dín Qubáchah, after he had already disposed of his other prominent rival, Táj-ud-dín Ilduz, in 612 A H. The issue of these provincial coins, at this conjuncture, would seem to attest the first voluntary recognition of Altamsh by Husám-ud-dín 'Iwaz, who was at this time in undisturbed possession of Bengal and its dependencies. The adoption of the Cavalier device on the obverse may have been suggested by the - conventional acceptance of that design on the money of the native princes of the North-west, whose hereditary types were copied by Muhammad bin Sám, and retained for a long period by Altamsh himself. In the new mintage, however, the Rájpút horseman with his spear is superseded by the Túrkí Cavalier with the historical mace,* and the general outline of the coarse Northern steed may perchance have been heightened to record a triumph, or to carry a menace to the subjected Bangális, who had left their king to escape ignominiously, and virtually surrendered their capital to the eighteen troopers of Muhammad Bakhtyár's advance guard.

Among other peculiarities of these coins is the tenor of their legends, which differ from the ordinarily adopted Imperial intitulations of the Sultán, who is here designated as القطبي, the slave or freedman of Qutb-ud-din Aibak,—a term which may have concealed a latent taunt to one who was now supreme in the chance. virtue of his arms, or may otherwise indicate the independent Khiljí method of discriminating the followers of Qutb-ud-din

^{*} Mahmúd of Ghazní's favourite weapon. Tradition affirms that it was preserved in all honour by the guardians of his temb at Ghazní. (Atkinson, Expedition into Afghánistán, p. 222). So much credence was attached to this ancient legend, that we find Lord Ellenborough in 1842 instructing his generals in sober earnestness, to "bring away from the temb of Mahmúd of Ghazní his club which hangs over it." Muhammad Bakhtyár himself had also won glory by the use of his mace in his gladiatorial encounter, single-handed, with an elephant, who was compelled to retreat before the first blow of his powerful arm.

[†] The name of Aswapatis, "Lords of Horses," was subsequently applied specifically in Orisá to the Muhammadan conquerors. Mr. Hunter remarks, "The Telugu Palm Leaf MSS. state that between (Saka 895) A.D. 972 and A.D. 1569, three great powers successively arose. During this period, the Gajapatis, 'Lords of Elephants,' ruled in Orissa and the north of Madras; the Narapatis, 'Lords of Men,' held the country to the southwards. The Lords of Horses were the Musalmáns, who, with their all-devouring Pathán cavalry, overthrew the two former."—Orissa, ii., p. 8. Stirling, Asiatic Researches, xv., p. 254. Kín-i-Akbarí, Gładwin's translation, i., p. 319. Abul Fazl, in describing the game of cards, affected by his royal master, speaks of "Ashveput, the king of the horses. He is painted on horseback, like the king of Dehli, with the Chutter, the Alum, and other ensigns of royalty; and Gujput, the king of the elephants, is mounted on an elephant, like the king of Orissa."

as opposed to the Mu'izzi faction of the nobles of Hindústán, who had already tried conclusions with each other, to the disadvantage of the latter.

No. 2. Gold. Weight, 70.6 grains. Unique. Gaur, A.H. 616.*

OBVERSE. REVERSE

Horseman at the charge.

ضرب نكور— In the field— فرب نكور— Margin—

المعظم الدنيا والدين الله بقاريخ سنة القطبي ـوهـان

ست عشر و ستمایه

This unique gold coin of the period, put forth under Muslim auspices, is of more than usual value in confirming the locality of the mint of its counterparts in silver, which are deficient in any geographical record; indeed, none of the Bengal coins, which form the bulk of the trouvaille to which the present notice is devoted, bear any indication of the site of which they were struck. Found, however, in company with so many clearly local pieces, there would have been little hesitation in assigning them to the southern division of the new Muhammadan empire; but the distinct announcement of the place of issue of the gold piece is of importance, not only in fixing definitively the then head-quarters, but in presenting us with the name of Gaur,‡ regarding the use of which, at this epoch, there was

For a figure of the coin, vide Chronicles of the Pathan Kings, p. 78.

امير المرومنين +

- † Qilij Arsalán, the Saljúq of Anatolia (A.H. 656), uses this title of بوهان إصير الموميذي (Fræhn, p. 156). The three sons of Kui Khusrau (A.H. 647) employ the term in the plural براهين
- as an isolated specimen of a hitherto unknown mintage, I was disposed, in the absence of any dot either above or below the line of writing, to adopt the alternative reading of instead of باركور while confessing a preference for the latter transcription, on account of the need of the preposition (Chronicles of the Pathán Kings, p. 79); but, at the time, I was unprepared to expect that Altamsh's sway had extended to the lower provinces, which were avowedly in independent charge of the Khilji successors of Muhammad Bakhtyar. This difficulty is now curiously explained by the concurrent silver pieces, and the supposition that the local chieftain found it expedient to profess allegiance, nominal or real, to the preponderating influence of the master of Hindústán. In like manner, the recently discovered silver coins have supplied a clue to the more satisfactory decipherment of the marginal legend, and the explanation of other minor imperfections in the definition of the exotic characters of the gold coin, which it is useless to follow in detail.

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some controversy.* Advantage has been taken in this, to the native comprehension, more elaborately-finished piece, to insert in the vacant spaces on the field, above and below the main device, the words, فرب بگور "struck at Gaur," and although the requisite dot below the be has escaped definition, there need be little doubt as to the purport of the entry, which it was not thought necessary to reproduce on the less-esteemed silver money, whose status with the mint officials, as equally with the public at large, ranged at a lower level.

The date of 616 A.H. on this coin, supported and in a measure explained as it is by the marginal legend on No. 3, proves that the professed allegiance of the local ruler of Bengal to the head of the followers of Islám at Dihlí, was no momentary demonstration, but a sustained confession of vassalage extending over one complete year, and portions of the previous and succeeding twelve months.

The topographical record on No. 2 would further seem to show that. Husam-ud-din had not as yet transferred his capital to the new site of Lak'hnauti, to the west of the river, whose designation first appears in a definite form on the coins of the Empress Raziyah, in A.H. 635.†

No. 3. Silver. Size, 7. Weight, 168 grains. *Very rare*. Pl. x. fig. 2. A.H. 616.

OBVERSE. REVERSE.

السلطان المعظم Horseman at charge.

Margin—

الله الا الله صحيد رسول الله الا الله صحيد رسول الله القطبي بسرها ن

No. 3a. Variety. Weight, 162 grs. Pl. x., fig. 3. Date illegible. The Persian legend on the obverse is given in very imperfectly defined characters, and offers the peculiarity of the insertion of the Hindi letters wi, for Sháh, above the name of the king, thereby indicating that both diengravers and the local public were naturally better versed in the old alphabet than in the newly-imported letters of the conquerors.

^{*} J.R.A.S. ii., N.S., p. 187. Cf. also Albirúní; Reinaud, Mémoire sur l'Inde, p. 298, quoted in J.R.A.S. i., N.S., p. 471. As. Res. ix., 72, 74; xvii. 617. Wilson's Glossary, esb coce, etc. Rennell, Map of Hindústán, p. 55. Stewart's Bengal, pp. 44, 57.

[†] Chronicles of the Pathán Kings, p. 107. J.R.A.S., N. s., II., p. 187, coin No. 14 infra.

Coins of Ghiya's-ud-di'n 'Iwaz.

No. 4. Silver. Size, 7½. Weight, 161 grs. (full weight.)

Pl. x., fig. 4. A.H. 616. (7 specimens.)

OBVERSE. REVERSE.

الا الله الا الله الا محمد المعظم غياث الدنيا الله الله و الدين ابو الفتح السكة في — Margin عوض بن الحسين نا صو شهور سنة ست عشرو ستماية امير المومنين

Coin No. 4 teaches us that in the same year 616 a.H., in the early part of which Husám-ud-dín 'Iwaz had confessed allegiance to Altamsh, he seemingly grew weary of such pretences, and openly declared himself Sultán in his own right, assuming the regal title of Ghiyás-ud-dín, and the quasi-hierarchical function implied in the designation of Náçir Anir Al Múminin, "Defender of the Commander of the Faithful." Whether this overt assertion of independence was suggested by his own growing power, or was due to the imagined weakness of the suzerain, is not clear; but there can be no question as to his success in the extension and consolidation of his dominions, or to his vigorous administration of a country, fertile in the extreme, and endowed with such singular commercial advantages of sea and river intercourse.

At this particular juncture, Altamsh does not seem to have been pressed by any important home disturbances, but there were dark clouds on the N. W. frontier. The all-powerful 'Alá-ud-dín Muhammad Khárazní, whose outpost extended over so large a portion of Asia, had been coining money in the inconvenient proximity of Ghazní throughout the years 613, 614-616, A.H.;* and no one could foretell when he might follow the ordinary precedent and advance into Hindústán. As fate determined, however, it was left to his son Jalál-ud-dín to swim the Indus, at the risk of his life, as a fugitive before the hosts of Chingíz Khán, in 618 A.H.

The mention of Chingiz Khán suggests to me the desirability of repeating a correction, I have already recorded elsewhere, of a singular delusion, shared alike by native copyists and English commentators, regarding one of the supposed incidents of the sufficiently diversified career of this scourge of the world, to the effect that his unkempt savages had penetrated down to the impossible limit of the lower Ganges. The whole series of mistakes, Asiatic or European, may now be traced back to a simple clerical error in the transcription from a chance leading copy of the ordinarily rare work of Minháj i Siráj—where the name of Chingiz Khán has been substituted for the more obvious designation of the ancient town of Jájnagar

Modern authors, examining a single passage, might well have felt reserve in reconstructing at hazard a primary version; but the editors of the Calcutta official printed text have gone so far towards perpetuating the enigma they were unable to unravel, as to add to the difficulties of solution by making Chingiz Khán fight (so far on his way to Lak'hnautí) the memorable battle of Perwan [30° 9' N., 69° 16' E.] on the conveniently converging site of Badáon (p. 348), which was situated on one of the favourite main lines of transit to the south, east of the Ganges. conglomeration is, however, the less excusable, as Stewart, in his History of Bengal, had already pointed out Firishtah's palpable mistake to the same effect; and the editors themselves unconsciously admit the preferable inserted in the foot-note, p. 199. Dr. Hunter, I see, in his new work on Orissa (ii. 4), incautiously follows Stewart's first impressions, in the notion that the "vanity" of Muhammadan historians had intentionally "converted the attack of the humble Orissians into an invasion of Tartars" (Stewart, p. 62).* I myself prefer the more obvious and direct explanation above given, which perhaps reflects more upon our defective criticism than upon Muslim vanity.†

* Mr. Stirling, in his most exhaustive Memoir on Orissa, published in the Asiatic Researches in 1822, observes :- "Major Stewart, in his History of Bengal, places an invasion of Orissa by the Mussalmans of Bengal during this reign, that is A.D. 1243. The Chronicles of the country contain no mention of such an event. I have not Major Stewart's authorities at hand to refer to, but strongly suspect that he has been led into an error by mistaking some word resembling Jajipur, for Jajipur in Orissa. He expresses himself thus: 'In the year 614 (A.D. 1243), the Ruja of Jagepur (Orissa) having given some cause of offence, Toghan Khan marched to Ketasun, on the frontier of Jagepur, where he found the army of the Raja had thrown up intrenchments to oppose him'. . . . Now, in the first place, Jajipur was never a separate principality, as here described; and there is no such place in Orissa as Ketasun. Ferishtah is altogether silent on this subject in his history of Bengal, but in his general history he ascribes the siege of Gour, in the very year in question, to a party of Mogul Tartars who had invaded Bengal by way of Chitta, Thibet, etc. Dow's mistake of a similar nature is scarcely worth noticing. He makes Sultan Balin pursue the rebel Toghral into Jajuagar (A.D. 1279), which he calls Orissa, whereas it is ovident from the mention of Sunargaon as lying on the road, that Jájnagar is some place beyond the Ganges."-Stirling, As. Res. xv., p. 274.

It seems to have escaped Mr. Stirling's notice, that Stewart had already corrected his own error in speaking of "Jagepore" as "Orissa," pp. 61 and 65, by placing that town in its proper position in "Tippefal," in a later passage (p. 70); and he further improved upon his advanced knowledge by saying in a note, at p. 72, "Jagenagur is said to have been a town in Orissa, near Cuttack; but this passage proves it to have been situated on the castern side of the Burhampooter. The Jagenagar mentioned by Ferishtah should have been written Jagepore." [?] Stewart, Hist. Bengal, p. 72. Dow, i. 202 (4to. edit.). Briggs i., 260. See also Chronicles of Pathán Kings, p. 121.

† Cf. Elphinstone (new edit. by Professor Cowell), p. 877. Elliot, Muhammadan Historians ii., pp. 264,844, Dr. Lee's Ibn Batútah, Oriental Tr. Fund, p. 97. Firishtah No. 5. Silver. Size, 8\frac{1}{2}. Weight, 165 grs. A.H. 617. (2 specimens.)

OBVERSE. السلطان المعظم غياث الدنيا و الدين ابسو الفتع عسوفى بسن العسيسن ناصر امير المومنسيسسن ناصر امير

No. 6. Silver. Size, 8. Weight, 169. (Coarse badly formed legends).

A.H. 617. (2 specimens.)

OBVERSE.
السلطان الاعظم
غيات الدنيا و الدين
ابوالفتع عوض بن العصين
نامسسو اميوالمومنين و
ولي عهدة علا العق

REVERSE.

لا إله إلا إلله محمد رسول الله الأاله الأاله الأاله الأاله الناصر الدين الله الميان الله الميان

No. 6a. Variety. One example gives the altered marginal reading of

ضرب هذه السكة في ربيع الآخر سدة سبع * * ستماية

Al Náçir li-dín Illáh was invested in the Khiláfat in A.H. 575, and died on the 1st Shawwál, A.H. 622 (5th October, 1225, A.D.). Bar Hebræus, Abulfaraj, pp. 269-301. Ibn Agir, p. 285, fixes his death at the end of Ramazán. Price, Muhammadan History, ii., 210.

The tenor of the legends of the consecutive issues of A.H. 617 disclose an increasing confidence in his own power on the part of Ghiyás-ud-dín' Ivaz, in the addition made to his previous titles, and in the assumption of the superlative Al A'zam, "the highest," as the prefix to the Al Sulián in place of the heretofore modest adjective of Al Mu'azzam, "the great."*

Bombay Persian Text, i., p. 122. Badáoní, Calcutta Persian Text, p. 88. Tabaqát i Náçiri, Calcutta Persian Text, pp, 157, 163, 199, 243, 245.

* Altamsh himself seems to have been indifferent to this distinction, but its importance is shown in the early coinage of Muhammad bin Sám, who invariably reserves the superlative prefix for his reigning brother, while he limits his own claims to the virtually comparative And further to mark these gradations, he prominently adopts the higher title after his brother's death. Chronicles of Pathán Kings, pp. 12, 13, 14. Ariana Antiqua, pl. xx., figs. 29, 85.

Here, for the first time in this series, we meet with the official or regnant designation of the Khalifah of Baghdad, who has hitherto been referred to by the mere generic title of "Commander of the Faithful."

It would appear from this innovation, as if Ghiyas-ud-din had already, indirectly, put himself in communication with the Pontifical Court at Baghdad, with a view to obtaining recognition as a sovereign prince in the Muslim hierarchy,—a further indication of which may possibly be detected in the exceptional insertion of the month in addition to the ordinary year of issue on the margin of No. 6a.; a specification which will be found more fully developed in the succeeding mintages, where it admits of an explanation which is not so obvious or conclusive in this instance.

No. 7. Silver. Size, 9. Weight, 169 grs. Pl. x., fig. 5.* Dated 20th of Rabi' ul ákhir, A.H. 620. (7 specimens.)

REVERSE.

OBYERSE. KILD IKILLS غداث الدنما و الدين ابو الفتح عو صعيد رسول الله ضبن الحسين قسيم امير المومنين الناصر لدين الله امير المومنين سلطان السلاطين في الدنيا و الدين ابو المظفر على يده في التاريخ العشرين ــ Margin من شهر ربيع الآخر سنه امير الهو مذين عشرين و ستهابه خلد الله ملكه

No. 7a. Variety. Weight, 165 grs. Coin of the same date and into the third عوض similar character, which transfers the complete name of reads more as الدنيا و الدين reads more as الدنيا و الدين the suggested يده , above given, appears as يدونو.

If the preceding coins had left any doubt as to Ghiyás-ud-dín's designs in regard to the assumption of sovereign power, the tenor of the legends on Nos. 7 and 7a, would conclusively set that question at rest. Here, not content with the recently-arrogated title of السلطان الاعظم, we find him calling himself "Sultán of Sultáns," by direct appointment of the

^{*} See also Marsden, No. DCCLVII, p. 564. There are two coins of this type in his collection in the British Museum. Marsden remarks, "The date of this coin, the earliest of those belonging to the princes who governed Bengal in the name of the Kings of Dehli. but who took all opportunities of rendering themselves independent, is expressed distinctly in words. . . . The titles and patronymics of the Sultan by whom it was struck are for the most part illegible; not so much from obliteration, as from the original imperfect formation of the characters."

No. 4,

Khalífah,* associated with which is the entry of a specific date, with the still more unusual definition of the day of the month, which is preserved constant and unvaried throughout the entire issue. More remarkable still is the abnormal departure from the conventional form of coin legends, in the omission of the preliminary "Al Sultán," and the abrupt introduction of the regnal title of the once probational Husám-ud-dín, under his more ambitious designation of Ghiyás-ud-dín. In short, the entire drift of the altered superscription points to an intentional reproduction of some formal phraseology, such as would be eminently consistent with an official transcript of the revered precept emanating from Baghdád.

I should infer from these coincidences that a formal diploma had by this time been conceded by the Supreme Pontiff, admitting the newly-erected kingdom Bengal within the boundaries of Islam, and confirming the reigning monarch in possession, with added titles and dignities. The date so prominently repeated may either be that upon which the patent was originally sealed, or more probably it points to the auspicious moment of the reception of the ambassadors, who conveyed the formal document and paraphernalia of investment, at the Court of Lak'hnautí. This assignment in no way disturbs my previous attribution of the inaugural piece of *Altamsh, + marking his attainment of the like honours in A.II. 626. The very concession to the Bengal potentate possibly led his once suzerain to seek a parallel sanctification of his own rights, which he had previously been content to hold by the sword: and the difficulty of communication with Baghdád over alien kingdoms and disturbed frontiers would account for a delay of the emissaries on the one part and the other, which would not affect the open ocean passage between the mouths of the Ganges and the sea-port of Baçrah.

[&]quot;The term علي يدي is of frequent occurrence on the early Muslim coinages, and is usually associated with the name of the officer—whatever his condition—responsible for the mint issues, as علي ده , which is translated by Fræhn as "manibus" (i. e. curse et opera) Ahmadis or "curante,"—a definition accepted in later days on the Continent as "par les mains de, par les soins de, etc. In the present instance it would seem to imply a more or less direct intervention by the Commander of the Faithful himself in favour of his nominee.

[†] Initial Coinage of Bengal, J.B.A.S. ii., N.S., p. 154, No. 1, note; Chronicles of the Pathán Kings, p. 46. Of course, this exceptional issue will now have to code priority of date both to the Bengal coins of A.H. 614, ctc., and likewise to the northern piece of Altamsh, No. 8, which must be taken as anterior to No. 10.

COIN OF ALTAMSH.

No. 8. Silver. Size 8½. Weight, 168 grs. Square Kufic characters, which seem to belong to Láhor or some northern Mint.* Pl. x., fig. 6.
A.H. 62*.

السلطان السلطان المعظم شمس المعظم شمس الدنيا و الدين ابو المعظم المعشم السلطان يعين خليفه الله ناصر 'مير الموصنين

REVERSE.

الا إله الا إلله
محيد رمول الله الله الناصر لدين
الله الناصر لدين
منين المور المور المور المور المور المور المور المور المور المور المور المور المورب ؟ —Margin منين و ست مايه

BENGAL COINS OF ALTAMSH SUBSEQUENT TO THE RE-ASSERTION OF HIS IMPERIAL SWAY.

No. 9. Silver. Size 8. Weight, 161 grs. Bengal type of coin.

OBVERSE.

السلطان المعظم شمس الدذييا و الدين ابو المظفر ايلنمش السلطان يمين خليفة الله ناصر امير المو منين

47

REVERSE.

As in Nos. 6 and 7,—coins of Ghiyás-ud-din, with the name of the Khalifah Al Náçir-li-din Illáh. Margin—

Altamsh does not seem to have found it convenient to proceed against his contumacious vassal, who was now ready to meet him on almost equal terms, till A.H. 622, when the coinage immediately attests one part of the compact under which peace was secured, in the exclusive use of the name

- * Chronicles of the Pathán Kings, p. 15. Pl. i., figs. 4—8.
- † This word as designating the coin is unusual; but we have the term در الفرية for the Mint, and the عني ضربة, etc., as the ordinary prefix to the الفنية or the Pathán monarchs. The letters on the Bengal coins look more like بالفرية, which, however, does not seem to make sense. Freshn long ago suggested that the word ضربة ought to be received as a substantive, especially in those cases where the preposition بل did not follow it, in the given sentence, as a prefix to the name of the mint city.

of the Emperor of Hindústán on the money of Bengal.* That the issue represented by No. 9, proceeded from the local mints, is evident alike from the style and fabric of the pieces, their defective metal, and the uncouth forms of the letters of the legends.

No. 10. Silver. Size 8. Weight 168 grs. (2 specimens.) Pl. x., fig. 7.

OBVERSE.
السلطان الاعظم
شمس الدنيا و الدين
ابو المظفر ايلندش السلطان ناصر اميو REVERSE.

لا إله إلله محمد وسول الله الله الله الله الله الطاهر بامو الله امير الله المير البو مدين المير الله فسسوب هذه هذه شهور سنة اربع و مشرين و ست ماية سسمينة سسمين و ست ماية سسمين

Al Záhir bi-amrillah, the Khalífah whose name is inscribed on this coin, succeeded his father on the 2nd of Shawwál, A.H. 622, and died on the 14th Rajab, A.H. 623 (July 11, 1226, A.D.). Bar Hebræus, Abulfaraj, p. 302.

No. 11. Silver. Size, 7. Weight, 167 grs. Unique. Pl. x., fig. 8, A.H. 624.

Square area, within double lines, following the pattern of some of the examples of Muhammad Ghori's coins.

السلطان الاعظم شمس الدنيا و الدين ابوالمظفر ايلندمش السلطان ناصر

The words امير البومنين are inserted in the interstices between the square area and the circular marginal line, as in the Dihli coins of Bahrám Sháh.†

REVERSE.

Legend in the area as in the last coin, with the name of the Khalifah Al Záhir.

ضرب وو سنة اربع و عشرين ماية

† Chronicles of the Pathán Kings, p. 118.

It might be supposed to be an open question as to whether Ghiyas-uddín 'Iwaz or Nácir-ud-dín Mahmúd,—the eldest son of Altamsh and his vicercy in Bengal-presided over the mints which put forth the coins classed under Nos. 10 and 11. As regards the latter, at present unique, piece, there can be little doubt, from its assimilation to the ordinary Dihlí models, that it formed a portion of the revised and improved coinage of the south after Mahmúd's defeat of Ghiyás-ud-dín in 624 A.H. In like manner, the on No. 10, as a prefix to the title of Sultan الاعظم Altamsh, points to a feeling of filial reverence, which is altogether wanting even in Ghiyás-ud-dín's repentant manifesto in the legend of No. 9. Mahmud's appointment to the government of Audh dates from A.H. 623,* and the tenor of one of the narratives of Minháj i Siráj would imply that he proceeded southwards with but little delay; so that all coins bearing the date of 624, with the name of Altamsh, might preferentially be assigned to his interposition, more especially as Ghiyás-ud-dín at, and prior to this, period had placed himself in a renewed attitude of insurrection.

Coin of Náçir-ud-dín Mahmúd Sháh, as Viceroy in Bengal.

The administration of the Bengal mints under the official auspices of Náçir-ud-dín Mahmúd, as developed in the issues Nos. 10, 11, leads up to and confirms with more full effect an identification I have hitherto been obliged to advocate in a less confident tone—that is, the attribution of the piece, figured in my 'Chronicles of the Pathán Kings,' p. 81, to the eldest son of Altamsh, at some period towards the close of his brief career. With these newly-discovered evidences of his overt intervention in the local currencies, the transition to a subuded and possibly paternally-sanctioned numismatic proclamation, in his own name, would be easy, more especially if that advance was made simultaneously with the effusive reception at Dihlí of the reigning Khalífah's earliest recognition of Altamsh's supremacy, coupled with the desirability of making this Imperial triumph manifest in those southern latitudes, where other dynastic names had already claimed a prior sanctification.†

Persian text, 180.

† Minháj i Sir.j, after completing his account of Náçir-ud-dín's conquest of Ghiyásud-dín 'Iwaz, and the transmission of the spoils to the Sultán at Dihlí, continues—

و چون تشریفات دار الخلافه اجضرت سلطان شهس الدین طاب ثرو رصیده از آفجهله یک تشریف گرانمایه با چتر لعل بطرف لکهنوتی فرستان ملك ناصر الدین علیه الرحمة بدان چتر و تشریف و اکرام مشوف گشت و همگنان را از ملوک و اکابر مملکت هند نظر بدو بود که وارث مملکت شمسی او باشد ـ فاما • • بعد از یکابر مملکت شده و برحمت حق تعالی پیرست ۲ ۱۸۱ و

(See also Elliot's Historians, ii., pp. 326, 329.) The Khalifah's emissary arrived at Dihli on the 22nd of Rabi'-ul-Awwal, (3rd month of) A.H. 626, p. , v, and news of the death of Négir-ud-dín Mahmúd reached the capital in the 5th month of the same year, p. 174.

Such an authorized augmentation of the Prince's state is rendered the more probable, as Altamsh in a measure shared with his favourite son the honours and dignities conferred by the Khalifah, and simultaneously extended to him the right to use an umbrella with the tint of Imperial red.* Nacirud-din Mahmud, the contemporary biographer remarks, was from that time looked upon as the recognized successor to the throne of Hindústán. Equally, after Mahmud's premature death, his father still so held him in honour that his body was brought to Dihli, and enshrined under one of the choicest domes that Eastern Saracenic art could achieve, which to this day, amid its now broken marbles, stands as a monument of the virtues of this prince, and preserves in its decaying walls the remains of + the first royal tomb of the slave kings erected near the capital, ton the shattered entrance arch of which we can still trace the devotional prayer of the father for the soul of his son, whose mundane glories he briefly epitomizes as "King of Kings of the East," implying, in the conventional terms of the day, all India beyond the Ghagra.

And still further to secure a contemporary memento of his lost heir, Altamsh conferred the same name and title upon a younger son, who, in his

* The founder of the Ghaznawi dynasty, the Great Sabuktigin, assumed regal state under the shadow of a red umbrella. Altamsh's ensigns are described as black for the right wing رايات ميمنه سياق , and red for the left wing ارايات ميمنه سياق . Mu'izz-ud-dín Muhammad bin Sam's standards bore the same colours, but the discrimination is made that the black pertained to the (thoris, and the red to the Turks, p. 1 rv. Ghiyás-ud-dín Muhammad bin Sám used black and red for the two wings respectively, p. 83.

† Insceiption on the Tomb of Sulta'n Gha'zi [Na'sie-ud-di'n Mahmu'd] at Dihli', dated a.h. 629.

اصر ببناء هذه القبه المباركة السلطان المعظم شاهنشاه الاعظم مالك رقاب الاعم ظل الله في العالم ذو الاعلن لاهل الذعة سلطان لسلاطين شهس الدنيا و الدين المخصوص بعنايت رب لعالمين الي المظفر الملهش السلطان ناصر احير الموصنين خلد الله ملكة لروضة علك الملوك الشرق الي الفتح صحمود تعموة الله بغقرائة و اسكنة كنف نعيم جنانة في شهور صنة تسع و عشرين و ستماية اا

This Tomb, which is known at the Maqbarah of Sultán Chází, stands amid the ruins of the village of Malikpúr Koyi, about three miles due west of the celebrated Qutb Minár. Asár-us-Sanádíd, Dihlí, 1854, pp. 23, 30 (Nos. 12, 18, Facsimile), and 60 (modern transcript revised). See also Journal Asiatique, M. G. de Tassy's translation of the Urdá text; also Journal Archæological Society of Dehli, p. 57, and Hand-book for Dehli, 1863, p. 85.

‡ Rukn-ud-dín Fírúz Sháh, another son of Altamsh, who for a brief period held the throne of Dihlí, found a final resting-place on the chosen site of Malikpúr; and his brother in deferred succession, entitled Mu'izz-ud-dín Bahrám Sháh, followed him into the Tomb of the Kings in the same locality.—Aşár-us-Sanádíd, pp. 25, 26. Elliot's Historians, iii, 382. Chronicles of Pathán Kings, p. 290.

turn, was destined to occupy the throne of Dihlí for twenty years, and the name of Náçir-ud-dín Mahmúd was perpetuated anew in the next generation under another dynasty, as the designation of Balban's heir, who carried it back to Bengal, where he was permitted to found a new family of southern kings, who for half a century succeeded in maintaining a fitful sovereignty, seldom disturbed by the more powerful Sultáns of Hindústán.

No. 12. Silver. Size 8. Weight, 163.1 grs. Unique. British Museum. Vide Chronicles, p. 81.

Obverse.

REVERSE.

السلطان الاعظم ناصر الدنيا و الدين ابوالمظفر صحمود شاھ بن سلطان

فى عهد الأمام المستنصر باللة (مير المومنين

Al Mustançir billah was inaugurated on the 14th of Rajab, 623 A.H. = 1226 A.D., the same day that his father Al-Zahir died. Bar Hebræus, p. 303.

I quote in illustration of my previous remarks, the legends on the special issue of Altainsh on the occasion of the receipt of his diploma of investiture in A.R. 626.

Weight of the B. M. Coin, 164 grains.

لا الله الا الله صحمد رسول الله - OBVERSE

REVERSE-As above, in No. 12, with similarly formed characters.*

It may be noted that on a like occasion of the reception of the Egyptian Khalifah's diploma at Dihlí in 744 A.H., Muhammad bin Tughluq adopted a similar method of exhibiting his respect by introducing the pontiff's name on the coinage to the exclusion of his own.

The identification of the individual, who styles himself Daulat Sháh with many high-sounding prefixes, on the subjoined coin, demanded a certain amount of patient patch-work, which I have relegated to the note below.†

* Chronicles of the Pathán Kings, p. 46.

† در ماه جمادی الاولی سده ست و عشرین و ستمایه خبر فوت ملك سعید ناسر الدین محمود بوسید بلکا ملك خلجی در ممالك لکهنوتی عصیان کورد و سلطان شمس الدین طاب ثراه لشکرهای هندوستان بطرف لکهنوتی برد و در شهور سنه سبع و عشرین و ستمایه کن طاعی را بدست کورد و تخت لکهنوتی بملک علاء الدین لمانی داد علیه الرحمة و در رجب همین سال بعضوت جلال دهلی باز کمد ۱۱

Text, p. 1 vr

Suffice it to say that Daulat Shah bin Maudud is the person who is spoken of elsewhere as Ikhtiyar-ud-din Balka'* Khilji, and who appears in history on the single occasion of his possessing himself of the kingdom of Bengal on the death of Naçir-ud-din Mahmud, and his subsequent suppression and capture on the advance of Altamsh's forces in the selfsame year, 627 A.H., he was unwise enough to record on his unauthorized coinage.

No. 13. Silver. Size 91. Weight., 168. *Unique*. Plate x., fig. 9.

OBVERSE. المستنصرباللة امير المومنين السلطان الاعظم شمس الدنيا و الدبن ايوالفتم إيلنمش السلطان برهان امير المومنين REVERSE.

السلطان
العادل شهنشاء باذل
عاد الدنيا و الدبن ابوالغازي
دولتشاه بن مودود
عضد خليفه الله ظهير امير المومنين
هم شهور سنه سبع — Margin
عشرين و ستهانه

The reading of العالقاتي is speculative: the letters العالقاتي are distinct, as are also the two dots of the بي, but that latter itself cannot be traced, and the visible remains of the character succeeding the العا are more like ألي than the suggested في.

سلطان سعید شمس الدین چون بدیار لکهذوتی رسید بعد از فوت ملك ناصر الدین معمود طاب ثراة و دفع فتدهٔ صلك إختیار الدین بلکا و Calcutta Text, p. ۱۹۴

In the printed text, under the first Court Circular list of the ملوك و إقرائه of Sultan Shams-ud-din, we find the following entry دولت شاء خلجي ; and in the second document, purporting to be a variant of that official return, we read بلكا علج ; and in the second document, purporting to be a variant of that official return, we read بلكا علج (pp. ۱۷۷ and ۱۷۸), which latter version is greatly improved by the Oriental Lord Chamberlain's list proserved in a MS. in the B. M. (Addit. No. 26,189), which associates more directly the title with the name, and identifies the individual as بالكافئة الدين دولنشاق بلكا عليه والمناس والم

* The word Balká has exercised the commentators. It may be found, however, in the early Ghaznawi name of Balká-tigin. لكي means a " camel colt," and تكون is "handsome."

APPENDIX

TO THE

Journal of the Asiatic Society of Bengal,

Vol. XLII,

PART I., FOR 1873.

CONTAINING

VOCABULARIES OF NAGA HILL TRIBES,

by Capt. J. BUILER and S. E. PEAL, Esq.

A Rough Comparative Vocabulary of some of the Dialects spoken in the "Nagá Hills," District.—Compiled by Captain JOHN BUTLER, Officiating Political Agent.

The plan I have adopted for designating the long sound of all vowels has been by placing an accent immediately over the vowel; thus & is pronounced like the Italian a, or like the English long a as pronounced in such words as "mast," "father," "ask," &c.

6 like the English a in "fate," or e in "prey," "convey," &c.

in like manner has the sound of the French i, or English ee as in "peep," or i as it is pronounced in such words

as "fatigue," "marine," &c.

6 as the o in "notice"; and finally

u similarly to the English long o as in "move," "prove," &c., or oo as in "school," "tool," "fool," &c.

Angami Nágá, Rengmá Nágá. Kutchá Nágá.	Kédá Lúlú
Rengmá Nágá.	Kémmé, Aghén, Tésho, Kéchang, Khilé khé,
Angámi Nágá. !	n, Dhá-Khásiché, nn, Dhá-Khásiché, Kaoi, Váká, Vádi, 5, Tomo, n, Kia-pézé, Lélé,
Kúki.	Khat, Lh.ttan, Dhá- létan, Koi-Kaoi, Chúng, Aúmhi, Atúm, Látúm,
Mikir.	Isi, Honkí, Ipoh, Unhoi, Anúng, Ponon,
Kachári.	
Авзатезе.	l g
English.	A, an, or one, a. Ets, Abandon (let. Eridé, go), v. Abdomen, n. Tolpét, Above, prep. Uporot, Abent, a. Gorházér, Abundance, n. Horoh, Accept, v. Loh, Grobo

		Túnlúi	Haimná
Hahigakhé, Kégwénto, Thébenio, Késhang, Kenthonmé, Kenthonmé, Régatá, Akurraché, Phinimú, Ponniu,	Kethang, Kégá, Shéki, Sungweméso, Hiangwo,	Chán, Péthiniu, Luvénio or Ru- vénio, Chembé,	to, Akérhung, Ataiung,
અ ∵ ∔	Shacha, Khré, Kevo, Sá, Thékhévá, Lá,	Képénotá, Kétchá, Kipé, Timelhu, Kémbá,	Bhi, Pété,
,'Hengchetang, Kibang, Anái, Thé, Thé, Kéhét-ngái, Mashatun, Amalumché- tang, Alép, Migilo, Thungwái, Hékhupga,	Ala, Gumlapı, Sha Alüngəsine, Kb- Akidelui, Ke- Nüngəsung, Sk- Nisaagehitai, The Hümbolkihir, Lá,	m, Nésuna, , Téhsi, Kéch-Akihot, Húi, ng, Műnkhutto-	bang, Ahing, Abonin,
ngdúno archit, or, or, hingo	ok, ing,	Nikúnkun, Sarbúrra, Sodét Kéch- úng, Timon, Chinlidong,	Akering, Kédob,
Logúthang, Langlo Báusi, Sádú, Sádú, So-ong Míkhrí, Bussáo, Mithi- Nidou, ré, Ségangjá, Kphrá, Lábh, Sotrú, Arléng Nágá, Kisson Gaphá, Sát,	Kajain, Hainthi, Haonshingba, Yaonghingha, Samliha, Arúdáng,	Hajaiba, Karrásá, Lémbá, Bár, Bar,	Gathang, Khrúp,
H. J. Francisco	ii; [5, 1]	n. Boyoh, a. Búra, n. Konp-jor, n. Botsh, ad. E'ké-likhis,	a. Jiá, a. Átái,
Accompany, v. Logot Jé, Acurate, a. Thik, Ache, a. Thik, Acid, a. Téngé, Acquain- a. Téngé, Sináki, tance, n. Advance, v. Kg-ho, Advantage, n. Lábh, Adversary, n. Hotrú, Adult, n. Déké, Adac, n. N. Sáne, Acc.	on, poon,	Age, n. Aged, c. Ague, n. Ague, n. Air, n. Alike, ad.	Alive, a.

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angámi Nágá. Rengmá Nágá.	Rengmá Nágá.	Kutchá Nágá.
y,	, dod	1	Timong, Aiakúng thé- ong, Inúná, Yásomét, Kédokávé,	Wallé, Kutchung, Hapinsétum, Númkhat,	Rá, Khokérrá, Kérrá, Petekiké me-Atháké chiashwe, nia, Thé, Rébi, Mémé, Rékré, Unré, Ké Ri,	Kérrá, Atháké árhé. nia, Mémé, Empú Unré, Kézong, Kechang.	
Always, ad. Hodái, Ort Nito, Amid, prep. Maj, majat, An, a, one, a. E'tá,	Š	٠_٠	b			Azogá, Kémmé,	Kát
Ancle, n. And, conj. Anger, n. Annually, ad.	ooyj. Krú, Krí, Tswthái, Krí, Krí, Trhong, Thámsí, ad. Bosore-bosor, Maithai-	, Yasuthái, Ár, Thámsí, Maithai-mai-	gbi, ::: thip, n-anin	Káokhimit, Alúngsáahi, Kúmkhút,	Phimhi, Ri, Nimo, Tichíképrá,	Phábéro, Aionkhé, Achang,	2 6
<u>_</u> r		tna, Khashima, Horima-há- phlo,	1g-ánú-	A 0	w.c	Tenta, Unpiong,	Ntiéná
Apiece, ad. Armadillo, n. Armlet, n. Armpit, n.	ad. E'tá-étá, n. Kémtai, n. Kákhoti, gol,		Isi-isi, Kárpú, Roi, Jing kép,	Khut-chiang- Po-po, khut-chiang Sephú, Tépphu Nathankul, Kétho, Kajánui, Sochú,	•	Kémé-kemé, Tépphé, Gi, Aniohsong,	Héppá

Péching	1	Kná	Mrs	2	Ném			Shíá	Baktop		Kébé	Zolú
Kohémbé, Lébú, Gotá	Khúri, Shén, Thongphitá,	Azú,	Késongchitá,	Akénio or	achenio, Poniví, Chong, Bo- Lháne.	Káthun,	Taboh thé,	Whagmo or	Chombúbbo,	Khú, Apigéndo,	Khégå, Sé,	Toú, Akambéu,
Pété-ki, Thillsi, Kilé Kholé	olé,		'Chésélé, Vés: Sédús:		 Khisamá, Xákú,	Kithochákhá,	Thévohchih,	Késho,	Somúbho,	Lokho, Isúpá,	Kenerr, Kérrá, Khé,	Lhé, Métho,
Akimvél, Thull, Kultun		Hépángá,		necna, Ngéshén,	Tángwál, Kétúntún,	Kotchá,	Bohphé,	Megilo,	:	Sakháo, Asámábéibé,	Alúmpilpul, Guoh, Wápam,	Búáné, Akéopiáhi,
Kédoh-kavé, Achút,	Phélo, Arnionon,	riot, Pinú,	Thúrnon,	Cno, Osso, Kethioi,	Rishúmár, Núng,	Pángángháp,	Fákok,	Réngo,	Rámfi-fakfi,	Thiyá, Kchúávé,	Kéfoh, Ákún,	Knkachú, Aringsé,
Gúrúmbhri, Péllá,	Thaphlá, Shong,	Téré,	Masúhá,	noa, Mánágilli,	Nágáro, Shimá,	Nikikhorni	Honohoi,	Hámián,	Mihojúr,	Salli, Khánaigiri,	Késhim, Wá, Tirkún,	Makh .m, Kúngjá,
		ehi,	જુ	n. Kěnsúá lorá,	n Boñrolá, n. Pithi,	n. Pás-dúár,	". Gáhori moņ-	gon, a. Béyá,	n. Máti-gáhori or Mihojúr, Thákúriá-	borá, n. Moná, a. Topá,		n. n. Bhoj, a. Udong,
Around, prep. Sáriofálé, Arrow, n. Kánr, Ascend		3	. 9	Babe, Bay, ".	Bachelor, n Back, n.	Backdoor, n.	Bacon, n.	Bad, a.	Badger, n.	Bag, n. Bald, a.	ď	river), ". Banquet, ". Bare, a.

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angámi Nágá. Réngmá Nágá.	Réngmá Nágá.	Kutchá Nágá.
Bark, (of a S41, tree) Bark, "Bhún Barn, "Bhún Barrel, (gun), Roll; Barter, "Rabb Bastard, "Johor	k, salighoo i, rah,	á, sinú í, péssá, phá- íba,	Théngú, Kánú, Sokporú, Illangpong, Milárná, Kású, Sorongro,	Thingoh, Ahup, Changin, Meipumlong, Kilhénghété, Kung,	Pokú, Sijha, Ré-shi, Telha-ki, Pú, Keli, Mékhú, Tékhrono,	Shainhel, or Shingel, Kerúan, Tiswán, Pong, Kélleché, Túkhong,	
Bat, n. Bathe, v.	n. Bádoli, v. Gá-dho, or Snánkor	pessa, Taupámá, Digrúnang,	Wárplák, Chinglúji,	Késiltum,	Ché-chá, Zúrélúché,	Sémphong, Lahté,	Téllá Dúpíá
Battle, n. Beak, n. Beam, n. Bear, n.		Chébá, Bokho, Súkúr Mússúbromá Khámphor,	Ron, Anktúr, Kardong, Thogwám, Múng,	Gál, Kmú, Inkúm, Vompi, Khámul,	Térrh, Ta, Ki-pér, Thégá, Támá, Mekh.	Térri, Méng, Kásun, Thágúa, Mekh-Mangha,	Hérnéo Múi Hégúám Múmai
Beat, v. Beautiful, c. Bedstead, n. Bedding, n. Bedding, n. Bee, n.	e. Kübáo, Már, a. Hündor, n. Hűá-khát, n. Tüli, n. Mo,	Sho, Cho Naibahami, Méo Thúthani, Kiii Kéc Péréká, or Pé-Pio,	knún, ng, ádim, hlinápé,	Votun, Védi náphai, Jálkhun, Ponphá, Húivá,	wémá, Vúché, Ngú-lévi, Thezi, Zikhrá, Mékhwi,	Vútá, ng, gpbé,	Ngsú-ída Jeokum Hélís

					•				-	병	
				Ъ	Káng			Káká	Kédi	Rhinns	
Ménthútha, Hodi,	Krohchiléché, ldétah, Hélo-	Hékátániu,	Shégi, Phitá, Kénja,	Kángha, Ghéntha, Ghén.	g, iŭréng,	Akéngkhúi, Athaiángwá-	shwa, Hiángwhá,	Azoká,	Kégáng, Jhén,	Phénogotá, Téga, Niubénio,	
Mithúchi, Mohzú,	Krohchiléché,	Kroh-kéchi-	Sáchá, Pilé, Pékhé,	Moché, Vadiché, Vádi, Vaká;			Sésá Kévi,	Donú, Metcho-Azoká,	léché,	Phálé, Phénogota Pérá, Téga, Péno, Képéno, Niubénio,	
Shilhutshá, Mésang,	Thúménétun,	Miváicha,	Núnglam, Vetún, Kasaiie,	Sélábú, Káowai onái Káowai,	nná,		:	Alaiúlúng,	Léupiahi, Chimpong,	Kántan, Vachá, Naoasowé,	
ok,	Chúbáng,	Kédúkébang, Miváicha,	Aphi, Lángnún, Ijoi,	Kángrong, Apoksodet, Apok,	ď	knún, omémo-	cnot, Jérsoméong,	Angbong,	Phréremá, Théong, Nokpák,	Koknún, Vo, Amangáthé,	
	Sainji,	Sainjiába,	Yáonhúng, Nái, Hánglúngmu-	, , , , , , , , , , , , , , , , , , ,		Pháikhong, Hamdáo,	Késsá-hám-	Kéjar,	ing,	ájai-	· S
n. Gorúrmongoh, Méshoháin, prep. Agot, Hamú-Sékáng, khé,	e. Mang,	". Mogoniá,	prep. Pisot, Pásot, v. Dékh, Sá, v. Hiñkoti kor,	v. Bébá, n. Bét-kámor, n. Pét,		a. Utom,	a. Tátkoi bhál,	Majot,	v. Háodhán-ho, a. Dáñgor, a. Dáú,		
Pre		Beggar, n.	Behold, prep. Belch, v.	Bellow, v. Belly-ache, n. Belly, n.		Best, a.	Better, a.	Between, prep. Majot,	ok yok	Bind, v. Bird, ». Birth, ».	

English,	Аззатеве.	Kachári.	Mikir.	Kúki.	Angámi Nágá.	Réngmá Nágá.	Angámi Nágá. Réngmá Nágá. Kutchá Nágá.
Birth-place, #.	Birth-place, s. U'pojá-thai, or Hájaiba, Ha- Jonomo-thani,	Hájaiba, Ha- thani,			Képénophé,	Kénuphén,	
Bitch, (female	Bitch, (female Maiki Kúkúr, Sémájúk,	Sémájúk,	Withunapi,	Winú,	Phúkrr,	Téhiphú, or	
	v.Kamor,	Wai,	Kornoi,	Petún,	Méki,	Unkate or Un-Nki	Nki
	a. Tits, a Kólá	Khábi, Késhim		Akhái, Avom		Káchá, Kékhá, Kéché	Kotíhá
Blind, a.	a. Kóná,		, je		Mhichié, Hékéc Tházá Laba Mazia	Hékécháng,	Michiépé Házá:
- G	n. Koli, g. Phúñ-dé.	_5	Mir, Kibút.	Kmúmbim, Mútun.	Puniba, or The-Mién, Whélé	Tezle, Mién, Téshi	Mápá
	a. Kám boroniá,		:	Adúmé,	• :		Nizai
		Rong,	Napat, Fillong,	Koúng,	Rú,	Snenpang, Rúng or Rong,	Liámkúá
Boatman, n. Body, n.	n. Náoworiá, n. Gá,	, af	Fillongkévé, Fbáng,	Koúngjábho, Kati,	Rú kethúmá, Moh,	Rúngécho, Meh or Um-	Liam-Ketsaimi Méo
	v. U'tolái de, or Méthonghá,	Méthonghá,	Kárklok,	Go-omsán,	Mékhrolé,	mén, Und-	
Bold. a.	Háhiál, or Nir-Bakhárobi, bhoi	Bakhárobi,	Phéréré,	Kékichapúi,	Kérézá,	wavesno, Kémé késsa,	•
	n. Hár, n. Púthi,	Pákrain, Khitáp,	Répi, Khitáp,	Shágú, Lékhá,	Rú, Léshi.	Thirra, Láshi.	Rá (Pérá) Léshú
	ř,	•	•	Kéng-ko, Athúnginlá- tun,	lé,	ta, tá, or rétá.	
			•		_	(manual)	

English.	Аъватеве.	Kachárı.	Mikir	Kukı	Angamı Nága Réngmá Naga	Réngmá Naga	Kutchá Nága
Brow, n Buck, (deer) n Buffalo, n Build, v	Konpál, Motá pobú, Moh, Hojá, Har, Bhotorá,		Téhang, Kedeap in Thiokalo, Lioi, Jilong, Kimun, Kimnun, Sátan Chamongalu, Bongchul,	කී	Tìkhá, 1 ekluá-po-hì, Relli, Sileché, Tìnudo,	Samphuh, Te-hangpécha Samchong, Thélotá, Mauthé, Paché	Kési Rélli Télo Ké tumséo
	, , , é,	Golli, Pakho, Papam, Saoha, Perékhokla, Phaba.	Golli or Amu Abor, Bhár, Kauon, Phukdak,	Mechang, Ponchun, Ghaltun, Gáphutun,	Mishi-shi Golli, K. 171, [álé, Pé, Rewala, Pe tu-Rolota, Baphina, Pro, Shonko,	Golli, Adu á , Rolota, Shonko,	Hégebaichi
Butterfly, n. Pokhila, Button, n Gudám, Buy, v Kin, By-and-by, ad Athoni, Bird cage, n Sorátor	n. Pokhlá, n Gudám, v Kin, nd Athoni, n Sorátor hojá,	Tamá, Gutám, Para, Yaokhung, Khangkluá,		_£	Sopro, Bullt-Kékú, Khir-leché, Tá,	Asa, Gudám, Hilota, Térrékhén or	Lúlúlo
Calf, n. Dámuri, Calf-(ofleg.) n Kol phul, Call, v Mát,	n. Dámuri, n Kol phul, v Mát,	Mésopéssá, C Tákithu, S Longhá, or E	Chamongáso, Sártı, or Hangnún,	Chilutmı. Katangaı, Gakotun,	Mithúno, Phitsa, Keshi-ché,	Ménthino, Chen, Kolokottá,	Kétúmpúina Kúlo
Cane, n Canon, n Cap, n	n. Bént, n. Bor Tóp, n Túpi,	Rain Kamon, Topi, '	Pri, Bortope, Photu,	Tıng, Lúzhu,	Thérr, 'Térra, Sidi, '. (Misi kédi, e Pithong, great gun,)	Térra, Pıthong,	Jaria Higibé-kedibé Potchom

Pello Hanii Tulo	Lalé Biá Hénám	ᄻ
Ai, Ténota, Ténota, Pongi, Sémbé, Bengris Kélélá, Mégi,	Gwáso, Riánto, Térréno, Anin, Soko or Sokhe Khon	Gwa, Diokhc logod Plué, Khella · Két Hánté · oka Shéshé, Kong, Chiénshé, Vor · Rotah or Ku- lo soèta, Récliénph
Poulé, Numo, Télé, Chopé, Zárr, Phá, Kélú, Kélilé, Mijjé,	Meli, Jwé. Jo Thévno, Nichum Mékho, Thékrr,	Phitché Mésá, Phrolé, Thwé, Khahu Séréchá Votzú, Mekú, í Trisi, Phirché ché, Siléché.
Potan, Méngté, Mántun, Lúngmúl, Chingling, Méhol,	Amen Anusé Kék Sáng	Angúrshé, Kénislutun Pon, Mei, Apár, Khánavé, Phálbi, Hongti
Inghornon, Méng. Niébnún, Unki, Lútiki, Lútiki, Ghainhemár Chilarnung, Hogwái,	Mélo, Om, Voáso, Oso, Bip, Kethoi Chendé	lki, Mésél Képú Pé , Inghon Aram Volo, Káusam, Ningkreng. Vángrún,
Horbá, Mű, Rém. Yongshimá, Senthrékomá, Jingiri, Shlainúng, Hangar, Runhái-ri,		1 aoshukor, Hamkhá, Hrikháobá Rei, Kolkhúlá. Pémankhuno Iláojéllá, Késhán né, Mái-ing Phái,
v. Búk, Boja lo n. Mekúri, v. Dhoi n. Biss, n. Sélá, n. Ghúlá, n. Hikoli, v. Holoni kor, v. E. ligar,	e. Hostá, n. Gái, n. Kúkúrá pú: T. Lorá, Thontorá Thútori, n. Géndéra,	n. Noku, a. Sophá, Nir a. Bophá, Nir n. Kápor, n. Megh, Dáor, n. Mokorár jál, n. Mokorár jál, n. Járkál, e. Jáh,
Carry. Catch, Catch, Catching. Catcrolla. Contipede. Chaff, Ch G. Chaff, Ch G. Chaff, Ch G. Ch G. Ch G.		Clean, "

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angámi Nágá.	Réngmá Nágá.	Angámi Nágá. Réngmá Nágá. Kutchá Nágá.
Conceal, v	o. Lúkúá,	Hoidádén,	Chipátúnon,	Gashéltun,	Kéváléché,	Kébéléché, or Kébélégot-	
Cook, & Copper, % Cord, % Cost, % Cotton, %	e. Hijúá, n. Tám, n. Jorí, n. Dám, Dor, n. Kopáh,	Shong, Tám, Wátú, Péshén, Khún,	Túnon, Tám, Phámri, Ador, Phéllo,	Hontán, Shomshún, Kháohúl, Amún, Patbo,	Sháléché, Vánlog Páisáji, Réngan Rerré, Amén, Chopsa, Chot-Téphú,	tá, Vánlogottá, Rénganú, Amén, Téphú,	
Cover, v	e. Dhá't. r. Lékh,Gononá-Sain,	Tháphúnátun, Limnon. Sain,	Limnon. Lékhánun,	Khúkhúntun, Shimtémin,	sá, Whé-hiché, Phréléché,	Shénota, Phúlo-gotá,	
Cow, n Cow-dung, n Coward, n	kor, n. Gorú, n. Gobor, n. Bhoiátúr,	ii, ásé-	Chainong ápi, Cháinongáhi, Phénéong,	Chilhatnun, Chilhaté, Mimédoi,	Thukr, Mithúbo, Kémithímá,	Ménthainio, Ménthébú, Unthúbinio,	Kétúm púi
Cowree, n Crab, n Crazy, o	n. Kori, n. Kénkorá, a. Boliá,	bong, Kháodi, Súbai, Kháng-Khrái, Chéhé, Kébir,	mdú,	Lúngchung, Ki, Mingolahi,	Kén-	Táshí, Chégú, Kénoiniu,	
Crooked, n Crow, n Cry, v Cubit, n Cubit, n Custom, n.	a. Bénká, Kokú n. Káúri, Dáok v. Kánd, Kérré n. Hát, Khúj n. Báti, Phon n. Dostúr, Niom, Tárá,	i, há, idé, alá, gtho,	Kékdáng, Vak, Chirúnot, Echák, Harlong, Aron, Thúnon,	Akon, Vā-ú, Kāptan, Vaulhéng,	wema, Weregwi Shijja, Kråle, Thú, Télhí, U zié,	Khurá, Tégú, Chilota, U'nká, Hángpén, Egotta, Déta or Délo-	Hégá

	Ting-ná						Hétohí
Achungabán, Náshitá,	Nío, Héká, Shégozo,	Sémúá, Aminchén,	Téshang, Chéngrotá, Terrogagwé,	Khwén, Aputengheng-	Sologóttá, Hiongbah,	Gwámo, Kejagi. Tégilo, Kénjinogottá,	Téhí, Kákhén, Insha, Shilotá, Chilogottá,
Tisonhá, Kéhúchié, Tingiukosho,	Nopvu, Khinhi, Héká, Satálé. Késsá, Shégozo,	Poniorogúwé, Sémúá, Répézé, Aminch	Tékhiá, Lákerlé, Térho Késho,	Nekhwé, 	Thé, Kérhú,	Shá-chá, Zú-rishádú,	Tefoh, Ki-Khá, Mokhrú, Kí, - Krá,
Niee Niee, Gálámtun Ngúpémé-	Chánúng, Súnlai, Athitai,	Nangong, Amánahajien,	Honkúmtan, Thilhagilo.	: :	Anéndédúí,		
Arni, Nise Nise Kánnon. Gálámtun Ingtingtanglo. Ngúpémé	Sopi, Arni, Gé-Thingtanglo,	Nothong, Adórsóong,	Thiok Nanghirnon, Arnamhingo,	Alám, Abidi-thekthé-	lo,or boyong. Túgnon, Térong,	Késso, Hilohong, Lonchor, Chétháknon,	Méthun, Ungháp, Vothúng, Vongnon, Túngláng,
Sainphrim, Pái, Anar,	Shio, Sáin. Thekha, Gé-	Náthong, Dorraobi,	Méi, Nokhai, Motainhainy-	an, Karráo, Hamiájákhá,	 Cháo, Phé- Doshimi,	ár, Léomdo, Cháimbi, Hadirong, kor, Ronjélainon,	Shissá, Térká, Dáothú, Sháin, Lúng,
ad. Diné-diné, v. Nás, a. Andhár,	n. Jiék, n. Din, a. Morá	cost-Mohongá,	n. Pohú, v. Nám, r. Rákhioh,	n. Dúán, a. Tán,	v.Khánd, a.Moilá, Phé-	3ém ág	n. Kúkúr, n. Dúár, n. Rópó, e. Súnsúrá, e. Khá,
Daily, ad. Dance, v. Dark, a.	Daughter, n. Day, n. Dead, a.	Deaf, a. Dear (cost-	ď,	Dialect, n. Difficult, a.	Dig, v. Dirty, a.	Disease, n. Distant, a. Ditch, n. Divide, v.	Dog, 3, Door, 3, Dove, 3, Drag, 6, Drink, 6, C

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angámi Nágá.	RéngmáNágá.	Angámi Nágá. Réngmá Nágá. Kutchá Nágá.
Drum, n. Drunk, a. Dry, a. Dry, a. Dry, a. Dry, a. Dry, a. Dry, a. Ear. Ear.	B. Dhol, a. Motoál, a. Húkán, v. Húkán, v. Húkás, n. Gú, n. Khor, n. Khor, m. Khor,	Khrám, Poglájábá, Ráinkhá, Karrainkhlai, Khi, Hoshábá,	Chéng, Hongangri, Akréng, Iai, Khréngnon, Hi, Képávi, Knokowa;		Kebbá, Injévémon, Késsá, Só, Thézá-bo, Nié,	Bén, Akénkoh, Phologottá, Abú, Nitun,	
e,	1 5	ale), Fetai nale), glá, phnéb	Nori, and Keding- chingro, Longlé, Chikáli, Niháng,		(for (for (s),	males), Té- males), Té- binié (for females), Kázi, Chingánié, Hékápi,	
Eat, v Egg, n Eight, a	v. Khá, n. Koui, a. Áth, n. Othéro,	Chi, Dáoti, Chái, Mágichái,	Choláng, Voti, Nirkép, Khrénérkep,	 Ghít,	-08	Túlogotta, Di, Tassé, Kipúmtassé,	Héssa
Eighty, a Elbow, n Elephant, n Eleven, a	a Ksi, n. Kilákúnti, n. Háti, Hágti, a E'gháro,	Pishábri, Yáoshúkong, Méyung, Májishé,	Throknirkép, Eritúngdé, Ingnár, Kré-isi,	Shomghit, Shom-le-khat,	tnetna, Lhé-théthá, Bútú, Chú, Tsú, Kerr-o-po,	Hain-tassé, Khoshé Piong, Sérrah-kame-	Rhé héssá Heppúá Kéké
Evening, n Eye, n	n. Godhúli, n. Sokú,	Sárriri, Mhú,	Ningvétung, Mék,	Hojinkon, Mit,	Théva, Mhi,	sha, Féugémésó, Nghé,	

			Phéngé	Na 2
Nghésan, Nghé,-ha, Nghéghi, Képan, Nokúngki,	Kajógi, Nthegáchâng, Apé, Trégaha, Anéndá,	Totári, Táinio, Ratá, Rúvinion, Khérhonin	ontesho, Sérra-pung- cha, Hainpúngh,	kkegata, Phushita, Chahasha, Phiphita, Jóngu, Ma, Kérréga, Sáháténotá,
. Ке-	chirr, Shá-chá, Lo, Pú or Apú, Gwákémo, Má,	Váchi, Pokrr, Péphirché, Rokí, Isá,	Kerr-o-péngú, Sérra-pulig. Lhí-péngú, Hainpúngh,	Kenne Zerrh, Kegata, Sú-shi, Phushita, Ngú-shi, Phiphita, Bichino, Jóngú, Mi, Kéraó Kérréga, Khoté, Sáháténot
Kémitkho, Kémitmúl, Kémitnél, Lihútán, Mijú,	Milin, Hépá, Ashushé, Alhá, Vé-Athaompüi,	Nésátan, Núme, Húnchaitan, Akihat, Thémchá,	Shomléngá, Shom-ngá,	Kikaptun, Shúngtan, Lén, Holtan, Kakhútjúng, Méi, Ngá-Mánin,
Mékúm, Méksúm, Mékhom, Kalchikoi, Chúbé,	g. Po,	dep, Phinon, Api, Vanun, Késso, Ongédelo,		Chichoktamé, Peplingnun, Abéng, Rinún, Chimon, Mé, Aphráng. Oknem-nún,
Mhúrgú, • Mosráng, Mhúgúrr,	i, 194, Debi, Pábá, Khosúr, Dáoprung Nir-Bolgiri,	Bokojiri, Mesainjé, Labo, Lémdú, Káisha,	Májrá, Pishágini thú. Ji,	ւր ուրչ, .; .; ., .,
n. Selaúri, n. Bhrúb, n. Pirikobi, v. Por, a. Misá,	a. Dúr, Antor, a. Motá, Téliyá, n. Bópái, n. Dái, n. Pákhi, a. Asokti, Nir-	Alop,	a. Ponsás, or Dú-Pishágini thú-Phúngo-Kep,	v. I.von kor, Shojlai, Basor phánd, Pákráng, v. Bisár po, R. Agúli, M. Júi, C. Pro-Sékáng, v. Pro-Sékáng, v. Másdhor, Viá,
Eyebrow, n. Eye-lash, n. Eye-lid, n. Fall, v.	Far, a. Father, a. Fault, a. Feather, a. Feather, a.	Feed, a. Female, a. Fetch, v. Fever, a. Few, a.		Figur, and Find,

English.	Авватезе.	Kachári.	Mikir.	Kúki.	Angámi Nágá	Angámi Nágá RéngmáNágá.	Kutchá Nágá.
Fish, n Fish-hook, n Fishingrod, n Five, a Fist, a Fint, n	n. Más, n. Borokhi, n. Brokhidánri, a. Páns, a. Homán, n. Páthor, n. Páthor,	Ná, Phishá, Pishaphéng, Wá, Shoniaibi, Wáiding, Khúem,	Lángok, Arpi, Arhiápúl, Phúngo, Kéklám. Árlong,	Ngå, Ngå-kui, Apó, Ngå, Akilhång, Shúng, Pachå,	Kho, Khoshégwí, Khosési, Péngú, Mézi, Jipvorú, Ménipú, or	Diniú saha, Hekhúbú, Késhibú, Púng, Jéjángménié, Uho, or Nién,	Ме́пд ві
Fly, Fog, Rod, Rode, Rocelinger, Forelead, Forest, Forest, Forest,	v. U'r, n. Künoli, n. Bhori, n. Bámún angúli, n. Konpál, n. Káthoni, v. Khémákor, v. Pahor,	Pénilang, Kúál, Yáká, Yáoshi, Tháin, Hakra, Dákhlaishi, Plao,	Iniornoi, Inghún, Ekéng, Múnjong, Téháng, Ingnám, Pédolánáng,	Lengtán, Améi. Kakéng, Kakhútchal, Kadéapang, Gámang, Elúngshianin,	ota-	Giénlotfa, Khélégesi, Phá, Jongú, Insompú, Třec, héu, Khigotta, Shángósha,	
Fort, n. Fortiff, v. Fortiff, v. Fortiff, a. Forty, a. Fourteen, a. Fourteen, n. Friend,	ad. Taháni, Púrbé, Shikánghá, n. Kónth, r. Konth.mara, Khórongká, or Gor-dia, solis, Dúkúri, Pishágni, a. Sári, a. Choidho, n. Kúkúrá, n. Kúkúrá, n. Mitá, n. Béng, Imbrú,	é, Shikánghá, Khórong, Khórongká, Fishágni, Mábri, Magibri, Daono, Kháphiong,	Hákoké, Korkébui, Korbuinon, Phili-kép, Phili, Kréphlli, Vo, Edonéráp, Chongho,	Kúl, Shom-li, Lí, Li, Shomléli, Achá, Kájol, U kéng,	, dá,	Nháká, Hainghé, Kéjhé, [ohé Sánnépéggé- Térré, Kámé, Sággé,	Rhédai ché Médaí é-

	•			_	Hammoi		-	dági,						óng,						
Kákhén,	Térráshá,	Gasen,	Lopimú.	Gokhé, Gots,	Tami,	Terrogha,	Gwá,	Tophá Kédági,	Abang,	or Athi,	Aninga,	, 6 m	Lorú,	Sekhu, Témé keshóng,	Kégano	Ajong pú,	Akeshin,	Akénjhú,	Kazı,	:
Ki-Khá,	Shi, Thésiéh.	Kévú,	Chi-shi.	Totá,	Tanen,	Terrho-diú, Soná	Kéví,	Tophá-Kedi,		Achap fu, or	Nono,	's Charles	Nba,	Teku, Mokhrú,	K6d: K676		Pezié or Ké-	pezie, Kerhé,	Kézi, Mácháro	STATE OF
Kot-pi,	Thingá,	Ihing,	Nume, E'nén.	Chétan,	Kelchá,	Páthénlúnjái, Soné	Kphái,	Náchákáng,	Hépú,	Hépi,	Kátú,	watunu,	Hámpá,	Kháo, Mikivúiná,		,		Khing,	Léshit,	::::
Nosékántékra, Hongthúang- Kot-pi,	nap, Athé,	Hánsopi,	Ariuso, Pinon.	Damnún,	Vi or Bi,		Méong,		Thú,	Phi,	Isúpo,	rdnsr,	Tipli,	Phélong, Arléng-Kini-	adúng,	Kemúnni	Kachinjok,	Akévé,	Longlé,	:::
Nosékántékra,	Bokrong, Pokhlú				Brén,	Mattai, Kashéo		-opu	Ajú,	Abi,	Chathai,	:	Sham,	Gúiúng, Phébthani.	; ;	Gáshima,	Kékhráng,	Kétháng,	Há, Dilom or 176	er to manue
	Gúti, Pitt	E (38)	7. Soah, 7. Dé.	Já,	Ságoli,	Iswor, Déo, Hón	a. Bhál, Bárú,	Rájhánh,	Koká,	Bûri A i,	a Náti,	L'acimi,			Bor Dérese	Búrá angúli,	Hiam boron,	z. Kénsá,	i. Máti, Nest	דו ביותי
Front-door, n.	Fruit, "Gúti, Gall-hiadder "Pitt.	Ginger, #.	Give. 7.	à		God,		Goose, n.	Grand-father, nKoká,	Grand-		ter	Grass, n.	Grass-hopper, Phoring, Grave, n. Moidám.	•	Great-toe, s.	Green,		Ground, #.	

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angámi Nágá.	Angámi Nágá. Réngmá Nágá.	Kutchá Nágá.
owder,	n. Hiloi, n. Khár, [ro,		Hil ć, Phélo,	Mépúm, Mélú,	i,	Másápúng, Khorri,	
Guts, #. Hail, #. Hair (of	7. Narı, or Bhun- 7. Hil, Súli,	Bhun-Pubú, Kédithai, Khnai,	H érré, Ichú,	Gil, Shám,	Riéh, Prr, Tsú-thá, Thá,	Tégwangácha,	
Hair (of animals)	ani-Nom,	Pékhmi,	Angmi,	Kmúl,	Mê,	:	
	6. Adha, E'do-	E'do-Kejar,	Abéng,	Akékhat,	Téchá,	:	
# # # #	F. B.	Lámá kéjar, Dáukabú,	Ajitím, Kibú,	, žį.		Kéchásén,	
Handsome, 7. Hawk, 7.	Húwoni, Sun- Húwoni, Sun- Hén,	dor, Y zota, Sun-Mechangbi, Dáolinghá-	Nerri, long, Kékhút, Méssén or Mé- Vomú,		Bi, or Bhi, Ngú-vi, Múvino,	Bén, Kágwá,	
Head, pro. Head, n. Headache, n.	pro.Hi, n.Múr,	khri, Bo or Po, Khro, Khró sháda	Báng, Niphú, Niphúsodé	Hipá, Kalúcháng,	Po, Tsú,	Higá, Api,	
				Ngaitan, Réniéle Kalúngchang, Mélú,	:	Akisá,	
Heavy, a. Heel, n. Heir, n.	a. Godhúr, Bhári, Rishibi, m. Gércás, Yashint! m. Wáris, Poriál, Hsiiriát.	no, no, bá.	Ardigúng, Kéngti, Paténg.	Agitá-áhi, Meswi, Kakhú-tárjum Phitso,		Nsúri, Phájha,	
-	kor, úkúrá,	edi	oún,	K-śnúng,	Voker,		

Aks Daichú Kihéga Hai I Héjéo
Heká, Ringcho, Khódróng, 1'ébopécha, Ténglogotta, Khadi, Kérrú, Ká, Ché, Ché, Gingéndé, Alé, Bingogeteniú, Tagi, Tagi, Ghophá,
Háki, Kéválé, Kizikhrú, Ligé, Kéjá, Kéjá, Kéjá, Kéjá, Méla, Téléché, Mí, Ká, Ki, Ki, Ki, Kii, Kii, Kidi, Kii, Kidi, Kii, Ki
Hékúm, Shéltan, Múlshang, Kákhérbú, Tútchiá, Vocha, Mantan, Hojiú, Atin, Atin, Asa, Ijátham, Ijátham, Ijátham, Ijátham, Mingol, Mitháiong, Trhi, Sakor, Keá, Mingol, Mitháiong, Thi, Súpihá,
Ládák, Tonnún, Inglóng, Vám, Kui, Phakálo, Phakálo, Népnún, Aláng, Anú, Lúsái, Katom, Hém, Kolopúson, Kolopúson, Koán, Phérro, Rosin, Inchám, Kangchir, Inchám, Kaselét, Unchín, Ingnárásó, Hijai or Jotsat, sat, Kechéng, Inthúnon, Choupignún,
ong,
ad lyst, c. Lúkris, n. Dhásoliká, n. Topils, n. Kúr, Kodál, n. Gáhori, n. Mójúl, n. Hing, n. Hing, n. Ghorn, d. Kenékoi, s. Ghor, n. Ghor, n. Ghor, n. Ghor, n. Ghor, n. Ghor, n. Ghor, n. Hing, n. Hing, n. Hist, n. Hist, n. Hist, n. Hiyál, n. Hotorá, n. Jánpmár, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Jánpmár, n. Hotorá, n. Hotorá, n. Hotorá, n. Hotorá, n. Hotorá, n. Jánpmár, n. Hotorá, n.
Here, ad. Iytt, Hide, Hide, B. Lüktü, Hide, B. Dhápolitá, Hája, Hoe, R. Kur, Kodál, Khudi, Hoe, R. Kur, Kodál, Khudi, Hoor, R. Mójul, Peredi, Hore, R. Hing, Hore, R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe R. Ghor, Howe Bichlai, Hunger, R. Káitá, Hunger, R. Bhúk, Haki, Rájáshi, Hunger, R. Bhúk, Haki, Rebir, Idle, R. Bhúk, Haki, Rebir, Idle, R. Bhúk, Haki, Rebir, Inon, R. Lió, Kebir, Méing-Jaokal, R. Hiyál, Méshron, Jaokal, R. Hiyál, Méshron, Jump, C. Janpak, Rhigit, Jungle-fowl R. Bon-kükürá, Dawi misi Jangle-fowl R. Bon-kükürá, Dawi misi Jangle-fowl R. Bon-kükürá, Dawi misi

English.	Авватеве.	Kachári.	Mikir.	Kúki.	Angámi Nágá. Réngmá Nágá.	Réngmá Nágá.	Kutchá Nágá.
Jungle, n. Keep, v. Kick, v.	n. Jongol, Hábi, e. Rakh, v. Lathimár,	Hágrá, Mtháo, Jiúphá,	Ingnám, Pédonang, Túrphit,	Gamlá, Néngatan, Chúntan,	ché, £-pot-	Khénottá, Nshishitá,	
Kid, "Kidney, "Kill, "	8. Sagolir Poáli, 8. Ghilá, v. Mar, Bodhkor,	Brinsha, [thái, Tháráp, Mi- Shúthai,	in,		che, Mécha, Dúkhriléché,	! ! !	
		Kásháo, Rája, Yáshgú,	Kengphú, Kengphú,	N1, Alúnáshi, Háoshá, Kakhúbú,		Kho.	
Knuckle, n Ladder, n	r. Canthi, r. Angulirgánthi, r. Jokhla,	, i	[ká, Si-	ká, Akikhitboh, Pélé, si- Kakhútchéng, Bikhrr, Léi, Khé		Abél, Jonghú, Shongphá,	
Lame, a	a. Khorá,	I acnomal, Khorré,	Kátékok,	Kéngbai,	Réhié,	Nphágwage-	
Language, "	". Mát, Bhákhá Kérokhábá,		Lámkáchésák, Kapáo,		Khwé,	mu,	
Leather, " Leather, " Leg, " Lemon, "		Ä	Arreng, Kéng, Théso	Ná, Sáwún, Kékéng,	Níé, Chiza, Phi,	Jongni, Agi, Phá, Tháshúshá,	
Length, s. Leopard, s	*. Dighol, *. Nåhor-phúté- ká Bågh,	snugar, Káláo, Mísíhathre,	Ajon, Kéthoi,	Adúng, Ajé,	Kéchá, Atháng Tékhú-khútti, Mamo,	Atháng, Mamo,	Kaoti

Choi		Pe-Umpémí		Jémbé	Héké Apúi	
Juta, Méngsi, Késhén, Jongúantén-	ga, [nin, Kotojoninahé- 	or Tame or Pe-I	Tha, Méi, Raté, Alénnin,		T, Châkágong, H Tékhú, Kzo, or Réncho,	Umpiong, Tépú, Mångkhong,
	khrócho, Seh, Phiéh,	Thépvomá, or Themmá, Merrosi,	. :,Ą		g ji	Saje-Khru, Répu, Zúché, Jz,
Aléétan, Ké, Kánél, Ngáitan, Anéo,	A sháo,	Mihim, Háithé,	Sá, Loú, Akinjang,	Jánkháng, Silatnoitui, Jong, Lhá,	rIhá, ,, Knú, Hénú, Molehang,	Lhimlúng, Júchá, Kámű,
Kangléknún, Chétürkéang, Túr, Arjunon, Kébi, Múnso,	Keding,	Arléng, Thárve-athé,	Ok, Bábámúng, Kánghon, Angbong,	Yérlo, Amokláng, Thévo, Chiklo,	Chiklo, o Chiklolongpi Chitún, Pé, Inglong,	Téplong, Gokingsho, Ho,
Spláo, Shráp, Khújar, Khánáolá, Khásébi,	Pákhá, Khaláo, Poshroh,	Shibúng, Thaijú,	Mokong, Múli, Shúkbá, Kéjar,	Hokejar, Abúdi, Mákhúsa, Tain,	Tam, Thamphi, Mámá, Hajiu,	Háphlo, Mécho, Kho,
isek, v. 186leks, kightning, n. Bijuli, kibi, m. Dight, kisten, v. Hún, kittele, a. Horá, Olop, kittele-finger, n. Kényš, angúili,	Agmongoh, Pákhá, Dighol, Khaláo, Haou-phaon or Poshroh, Ukhá-ehor	Manúh, Pú-Shibúng, rúh, Túh, Km, Thaijú,	a. Mongoh, a. Dorob, Dárú, a. Botá, a. Maj,	a. Honmajo, r. Gákhir, r. Bandor, r. Máh,	n. Moh. n. Ai, Mátri, n. Porbot,	n. Háphlú, n. Nigoni, n. Műkh,
Lick, " Lightning, " Lip, " Listen, " Listen, " Little, a	Liver, n Long, o	Man, n Mangoe (fruit), n			in, toe	Mound, Mouth, M

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angami Naga.]	Réngmá Nágá.	Angámi Nágá. Réngmá Nágá. Kutchá Nágá.
Mud, ** Musket, ** Musket, ** Nail (finger),*. Naked, ** New, prep. Neck, prep. Neck, ** Necdle, ** Nephew, ** Net, (bird), **	* Boks, * Hiloi, hes. * Gonph, er), * Nokh, a. Naingts, prop. Osorot, f. Dingi, * Batiji, * Habatiji,););	n, t, t, t, t, te(t, k, k,	is in the control of	Kia, Missi, Tamá, Tamá, Bitaé, Ji, Kom, Loh, Kerebnoki, Takepre, Takepre, No or Voo, Takepre, No or Sazeono, Petrá-krú, Zú.	Masaping, Méngha, Dachén, Niakémo, Ninan, Ghiunda, Pén, Aséjinganiu, Ané,	Ké
,		Katsin, Bisha, Hor, Shiko, Majishigu,	Kemi, Koráso, Ajio, Sirkép, Krésirkep,	Athá, Ján, Kó, Shom-lé-kó,	sá, kú, úpomo-	Késhé, Asénganiu, Chéngarzén, Tákká, Kemmélo- shiánki	Tingmúi Hékowi
Ninety, a.d. No., ad. Now, ad. Oil, s.d. Once, ad. Once, ad. Once, ad. Once, ad.	a. Nowoi, Noboi, ad. Nái, Nohoi, n. Nák, ad. Etiya, r. Tél, a. Búrs, Púroni, ad. Ebeli, Ebár, ad. Ebeli, Ebár,	Bishá brithogi, Niá, Pokúng, Dúha, Tháo, Káráshá, Alángshi, '		Shom-kó, Aompoi, Nákủi, • Tứn, Shatháo, Tếshế, Alúi, Khấtvế,		Hain-takká, Múlé, Hikong, Ncho, Ichéudi, Kéthén, Gwéngwo,	Rhé-hékowi La Chú

Habbák-(wild-	pig, U'nkia) Tenghúan	Kwends .
Shongin, Homthira, Teghoniú, Khénsén, Kivénion, Gédá,	pig, Ni,) hāisbén, hāisbén, lei, lei, eghoinin, nchong.	Shilogottá, Jhenta, Pien, Chinaurha, Tegi, Tegi, Kehâng, Chonnurottá, Kwendá, Tún,
m s,	pig, Méngi), r Topér, Tekwé-Si, T Théri, T Mhéji, T Sékrú, U Réphé, K	Teshile, Neshi, Neshi, Thezi, Thezi, Kerhi, Keneri, Kerlie, Keweda, Tie, Tie, Te, Chiko,
Lothúltil, Khová, Shamátalái, Chiffo, [lip, Mérono Chimbúcháng-Rékhro, Anáí, To-oiai, Rádí, To-oiai, Rádí,	•2	Loitan, Shontau, Púm, Yūkhai, Go, Júnam, Khing, Ksan, Honkitan, Gondå, Bú,
Arsún, Homthirá, Yángré, Voinghú, Késso, Vórsm,	Vothúng, Phéngúa- Pháng, Bi, Kédúk, Yohlbong,	Vongrnong, Doinún, Phán, Yárbop, Arve, Júpi, Akévé, Akévé, Aké-ér, Sángrún, Kindú, Rg, An, Sáng,
	Dáophri, Tháilúpháng, Rú, Dúkhiá, Médei, Thátái,	म के दिन हैं।
** Frisz, [téugé, Shámphráng, ** Húmthirá- Héndra, ** Maúrá, Pomágéthé, ** Phénsa, Pháchú, ** Bikh, Shábá, ** Moirá, Homo.	ď,	Thelide, Mar, Mar, Ruá, Borokhún, Endúr, Keñsé, Rongá, Lál, Jirá, Ubhoti áh, Gonr, Kámi-har, Bhát,
Onion, s. Orange, s. Orange, s. Orphan, s. Owl, s. Pain, s. Peacock, s. Pic.		Puth, e. Puth, e. Batter, n. Batter, n. Batter, n. Batt, n. Batt, n. Bed, a. Bed, a. Beturn, v. Beturn, v. Beturn, v. Beturn, v. Batter, n. Bite (cooked), n. Bice (un-

English.	Assamese.	Kachári.	Mikir.	Kúki.	Angámi Nágá.	Réngmá Nágá.	Angámi Nágá. Réngmá Nágá. Kutchá Nágá.
•	Sohoki, Dhoni, Kanáng,		plang,		Méhni,	Kegwaniu,	
Bing, s.	S. Angothi,		Arnán, Kómán	ć		Bénkhi, Kémén	•
	5				ř.	Dikégong,	
		Lámá,				Cháng,	
	. Jori.	Fopnang, Dúshá.			Kerré,	Rong,	
	,Gelá,	Sháokhá,	J.	Amon,		Réngosho,	
Rupee, A.	A. Toká, Rúp,	Ráng,	Rúp,	Shúmchéng,	Ráká, Mátes	Tebipong,	
			Chingbarchit.	Jotkhat,		Kégwénto,	
	m. Báli,	_	Sangti,	Pilnel,		Hácháng,	
Sap,	Roh,	, 20,	Théngpéan	Knai,		Shinkong-	
			kokarláng,			niudi,	
Save, o	v. Udhárkor,	Mathangba,	Jokflotlonone-	:	Pevele,	Thewekhi-	
	Koh. Bol.			Séitan.	Púlé.	Chogotta.	
Scratch,	v. Knsora		Káchéphú,	Khot-tan,	iché,	Nkhmé,	
	Sá, Dékh,			Vétan,	Pisiché,	Phita,	
	v. Dhor,	Rém,	Népnún,	Mánin,		Ténotá,	
	. Hat,		Throksi,	Sági,	Théná,	Sent,	Hens
Seventy, a	a. Hotor,	Fishäkethäm-	Throksi-kep,	Shom-sagi,		Ham-sini,	Khe-hena
Seventeen, a	Hotero,	Thojishní,	Kréthroksí,	Shom-lé sági, Mekú-pomo-	Mekú-pomo-	Unkipému-	
Shade, s	*. Sániá, Sán, «. Torang,	Shainkhlith, Pábi,	Abin, Lángákángde,	Alim,	thena, Tisú,	Asa, Dikshem,	
	.)		

					Ali-púí Hérro	Rhé-herró	Hanéi Achú
Kéjómáré, Kéngéno-	gotta, Sérrálogotta,	Thégo ttá , Ki, Kéddi,	Abé, Dwánogotta, Rú,-gwámó,	Léthéta, Aléki,	Amó, Bhéintá, Sérro, Unkínémo-	Serro, Hain-Serro, Chém, Jibénkhé, Gwén-cwén	Kessérú, Késhén, Arrénié, Pérré, Hichá, Nio,
Méngá, Kézáléché,	Kérsiché,		Búkhé, Kévásiché, Mháchi,	Kakajé, Chellisiché, Alápvo,	Bálé, Súrú, Kerr-o-Súrú.	Lhi-Súrú, Jih, Jiléché, Rékrihe-rek-	rihé, Chi, Kéchi, Théngúsiché, Thhi, Hidi, No,
Ajá, áchai, Homin,	Nolhimin,	*2	Kalinkó, Nágátongin, Kná,	Shumchéng, Lásan, Kánáomí,	Tovin, Gúp, Shom-lé-gúp,	Shomgúp, Vánchúng, Lúmtan, Olcháchan.	Achingthé, Anéo, Nátan, Gúl, Hiti, Kachápá,
Thrágdúk, Thágnún,	Arsúnon,			rup, Lúngilún, Ningjirpi,	Korpi, Nínon, Thrók, Kréthrok,	Throk-ké, Sinéng, Inot, Péiu-péiú,	Kerré, Bihék, Angnimdo, Phirúí, Lápú, So,
Lágikhá, ¡Thrágdúk Bhág-Bánthá-khlai, ¡Thágnún,	Pobi,		r naoparong, Phúnghá, Lémdhé, Sháth:	Bhándaó, Bhándaó, Dós:	Khám, Máto, Majito,	Bishágothám, Púgur, Nákasháo, Ihúda dong, Khéré-khéré,	Láthúa, Kháshibi, Mârrámbéi, Jibú, E'dinú, Anshá,
n.Láj, , v.Bontá, Bhág- kor,	v. Dhoroá, Soká- Pobi, kor,	e. Khúrủá, n. Phor, Dhál, a.Súntí, Khatá, Ks. Kándi	ř,	Gánkor, Bhoni, [ká] Jáháhú Khá	Boh, Soi, Holo,	a. Háthi, n. Sal, n. Akáh, v. Hó, Toponijá, dd. Dhiré-dhiré,	a. Téngor, a. Horú, v. Húpgá, n. Háp, ad. Ené, Téné, n. Putro, Puték,
Shame, n. Share, v.	4	Shave, v. Shield, n. Short, a. Shoulder, a.		n-law	ਜ	Sixty, a. Skin, n. Sky, n. Sleep, v. Slowly, ad.	Sily, a. Small, a. Smell, e. Smell, e. Snake, n. So, ad. Son, n. Son,

English.	Азвитеве.	Kachári.	Mikir	Kûkî.	Angámi Nágá.	RéngmáNágá.	Angámi Nágá. RéngmáNágá. Kutchá Nágá.
Sour, a.	a. Téngá, a Maiki cáhori	Mékhri, Homá	Hánthor, Phákáui.	Théthú, Vo-ánú.	Khié, Vokrr,	Késsáng, Tébohoú.	
				Kháp, 'Téngchá,	: .	Nka, Méi,	
Spider, #.	a. Mokorá, v. Thúi-péloá,		mún,	an,	ché,	Káutéroh,	
	a. Jorkhapori, a. Sári súkiyá,	rBothla, ıbri,	Konáphili,	Vingli,		Péj-je,	
Stab, v.	e. Khóns,	Yébá, Hathrái	Kétok, Chiklo-longso	Súntan, A-ási.	Pézachi, Thémú,	Chémtá, . Chama.	
	Sur kor,		Kéchonghú,	Gútan,	ihé,	Kérrahé,	
Steam, n. Stick.	n. Bháp, m. Bári. Láthi					Akennu, Than,	
ع.		úbúi-	Arlong, Pok.		áká,	Cho, King.	
		ong, Péléugbi,	Kékéng,	ké,		Jiji,	
	Júrí,		طُ 		Vá-Kérr,	Díríkéssé,	
4	Bol, Hokti,	Bol,		dung, Ahat, [gin.	gin. Káméti,	Aréniá, Rvítá	
e 5 .	v. Sohá, Hohá,			ď	lé, l	Chéntá, Uditá	
Swear, r.	F. Beli, v. Hopotkhá, ľdé, Semájdáonbá, Hoppe Hogy, Hossinkh li	's	Amı, Sémétángnún, Karkok	NES, Keháchélin, Théin	léché, leché,	Chwéngottá, Khogottá,	
,	a. Hoád, Mithá, Kéddi, Dibi, Kédok,	Keddi, Dibi,				Néni,	

		Ке́те́				Náng Né Késhúm	Achú	Herrakedi Nái
		Ke						Herr
Amá,	Khilogottá, Táchosáng, Shirhénghot-	Sérráh, Hidén,	Li, Nchángki, Lúkí, Sémépan,	Kéréhéniu, Répúbén, Hi,	Songni, Songni, Sáha,	Né, Shám, Késhán, Phéngottá,	Chingashén Jong,	Phén', Témá, Nthé, Ajongro,
Mi,	Léléché, Rékré, Kihásiché,	Kerr, Dza, Liko,	Lú, Tsé, Chinú Lúkí, Mélloh,	úma, Ihú,		hé,	Prthé, Hidi,	Pháléché, Tékhú, Thá, Phichino,
Améi,	Lán, Látan, Ásángpi, Loiétan,		Hiacho, Hiténg, Héáchún, Asábébú.		Shom-thum, Kádangácháé. Ling,	Náng, Já-shom, Thúm, Páitan.	Vánágúngé, Hithúchú,	
or Armé,	Ponún, Kángtoi, Ségnún,			~. ~		Náng, Súri, Kéthom, Pédátnún	. 'o	imún,
	_	Tháúji, Lidaodi, Poshi,	gbá, sá,		Bishasi-maji, Shámfráng, Shú.	; ihi, ám, ibá,	Nokhásáogá- rémá, Ei E'dlái,	Khá, bág, Raikhon, Tinni, gúli, Yáshishá,
n. Négúr. or Nez, Permái,	v. Loh, a. Ukho, r. Pholá,	a.Doh, Tháúji, n. Phol-guti, lak, Lidaodi, pro Hibont, Hibi-Poshi,	a. Ho, Hoto, ad. Tétiyá, ad. Táté, n Dáth	a. Sór, a. Pátol, pro Ei Eito,			, , E	v. Bondhå, Rhá, R. Bentásorábág, Raikhon, s. Aji, R. Bhorir angúli, Yáshishá,
Tail, ".	Take, v. Tall, a. Tear, c.	9			Thirty, a. Thirst, n. Thorn, n.	g,	Thunder, n. Thus, ad.	Tie, v. Tiger, n. To-day, ad. Toe, s.

English.	Аватеве.	Kachári.	Mikir.	Kúki.	Angami Nágá. Béngmá Nágá.	Réngmá Nágá.	Kutchá Nágá.
W, 6		Dákhná, Sálái,	Pénnáp, Dé,	Jinglé, Káléi,		Séndú, I,	Chonai
_	i, Hát-dé,	Háthái, Wainchéng, Káding,	So, Théngthom, Otnún, [pi,			Háh, Máná, Hollottá,	
Tree, Tribe,	. Gos, t. Khél, játi, t. Honsé.	Wongphang, Shéngfong, Kébél.			Si, Thino, Kétho.	Sén, Késan Laha	
		Máji-jini, Bishási,	Kré-hini, Nkoi,		kéná,	Serrah-kéhiun- Kérré-kéná Nki, Nkai	Kérré-kéná Nkai
Unbind, v.	v.Mel, Khól, Dodái,	Gilli, Khrú, Adi,	Fioknún, Pomú, Pomú,	ni, Lhámtan, Hépangá,	Nenna, Phishiché, Né,	Kennun, Tingottá, Anio,	Aenna
ther's side) #. Uncle (Mo-	Momái,	Maoshi,	Pinú,	Hénúngá,	Amúi,	Ajhú,	
Unite, v.	v. Mil-kor,	Jorájú,	Kangthún,	Kihotavin,	Kéméthúsi-	:	
Unripe, a. Vegetable, n. Village	a. Nopoká, Kén-Kéthang, a. Hák, Shámlái, B. Gaon, Nolai,		Akévé, Hán, Rongso, Pérom	Aminto, Mé, Kho,	10, 18,	Miémo, Hén, Phén, Véiséne	
	e. Goromkor,		Páromnún,	Olúmtan,	Péléleché,	Thikéiyéng,	سدردون
Wash, 9 Water, 8 Wast, 8	e. Dhos, Shú, Shú, R. Jol, Pani, Di, P. Mom, mo-hitá, Péréshlái,	Shú, Di, 'Péréshlái,	Késhoknún, Láng, Júir,	Shoptan, Túi, Khoilú,	Késchúché, Dzú, Mékhwi,	Káthú, Di, 'Khúchién,	

	Daig s	Daino	Chúng	្ន
Néale, Héká-kéchié, Nchákosho, Dé	Dékéthogá, Dekhahá, Dékkú,	Nepe. Nempuen, Yesha, Orú. Oré. Die. [má. Κέσάση, νι- Μαςιπιά,	Sámi- Marcéniú, [má. Néniu, Chémpá, Sá, xí, Táiniu, Shén, Roén,	Pipé, Ataian, Atién, Unháng, Jé, Ndú, Ndú,
Hokoh, Náki-kélét-á, Pét-éléché, Kézi.	Kéziki, Dékéthogá Kinú, Kirá, Dekhabá, Kiú, Kéziú, Dékkú,	Nekhr. Téshá, Nékhr. Téshá, Norú, Soporú, Dé Zá, [má. Kézáon, Sathémipvo- Maginiú,		Pzú, Nékoh, Chi, Loiá, Uwé, U, Ndú, No, Na,
Kého. Málam, Okotan, Dham.	Ttiáham, Hoikamham, Hoichú-ham,	Arangu, Lekhá, Koináhim, I'ham, Totan,	Pagong, Thémi, Kima, Hui, Tikhra, Hui, Mezaro, Monkhat, Zé, Aoims, Thémix Thing, Thémix Thing, Si, Kákhutchéng, Búché,	Jar, Nángho, Kúm, Kúm, La-Ahinái, Thaini, Náng,
Népénpén, Nichi, Kécham, Koni	Konantú, Kodak. Kolomá,	Arlú, Arlú, Pilúma, Thédung, Ifémeni,	Hennepo, Pesso, Timon, Long, Arlico, Théngpi, Erikau, Toknun, Lá-	khanin, Sokáduk, Naugpéng, Néngan, Aké-ét, [hilo Kélang, La Túmi, Né,
Ajongphái, Sainjorobá, Késhi,	ra, Pakhlái, Paráhá. Shommú,	Rophu, Horim á, Shomú, Wárbi,	á, Dilam	Thá, Núngjáng, Náithái, Kúrmon, Kébi, Méia,
- a.r	Kétiya, ót, nto,	Soga, Cin, Kon, K-loi, Kivo, Bohol, Bánri,	Sonrolá, Cirotá, Ghoini, Sotah, Sotah, Shitorot, Shitorot, Tiri, Maiki, Khori, Kath, Hátor gánthi, Likh,	n.Kosú, n. Rosú, n. Bosor, n. Halodhivá, ad.Hoi, Erå, n. Káli, Joá-káli, pro Toi, Túmi,
We, pro Alm, West, n. Posim Wet, r. Bhija		White, a. I. White-ant, n. I. Who? pro. I. Why, ad I. Wide, a I. Widow, n. I.	r, pre pre	Yam, n. Ye, pro. Yellow, a. Yes. ad. Yes. ad. Yes. r. You, pro.

Vocabulary of the Banpará Nágás.—By S. E. Peal, Esq., Sibságar, Asám.
(Continued from Journal, A. S. Bengal, Part I, for 1872, p. 29.)

In the following vocabulary á represents the a in bar; a stands for au as in naught; ai, as in aisle; au, as in loud; e, as ei in eight; é, as in hen; i, as in hill; i, as ee in heel; ó, as the o in not; o, as in note; u, as in full, and ú as oo in fool.

v∂k. Abdomen. túák. Able. dinko. Above, kak (kuk). Ache, mák. Acid. árêm. Across, jún. Acute. рú. Adder, vá. Adze, rá. Afraid. pai tú. After. arúpá. Aged, vin. Air, **á**ráng. Alive, táve. Alike. pang ve. All. násá. Amber, hótán. Among, **á**pú. Ancestor, hárang. Angel, mais, lit. flesh. Animal, tchi ding. Ankle, tzik tzá. Ant, mai ki. Antelope, saákáng. Ape, tzak or chuk. Arm, ha bit. Armadillo, gán. Arrow. lábú. Asbes. sam. Astray, rang. Atmosphere, jan mat. Awl, pau tú, pau ha. Away. vá. Axe, chang, tchang. (dao), nâsím. Babe, tákí Back. man me. Bad, ran vak. Badger. nitzung. Bag,

Bait. Bamboo. Bank. Banyan-tree, Barn, Bark. Base. Basket. Bat, Battle. Bead, Beam. Bean, Bear, Beard. Beat. Bee, Beetle, Before, Bell. Bellows, Belly. Below, Belt. Bench. Bent. Best. Betel-nut, Between. Big, Bird, Bird-cage, Bitter, Black. Blacksmith. Blanket. To bleed. Blind, Blindness.

púsên. nvad. shwak túm. ngau, mú. púng. pan kan. hâtâng. shók shá. âpak. pâk pi. ran, rón. lík. páng láng. pia sá. tchap, chup. mun pú. pit. nánaí. tchong. tât le. linglo. zêtpú. vák. hâpâng. rú pák. lia. kúm. hánkú. kovai. hatang. chóng. shóksh& ká. nu nak. cháng lik. nĹ. adzi le. dók. mik dók le.

na kon.

adzí. lood. púá. lossom. nak che. llue, vák la, mai la. oar. loil, rzán, orzán. 3one. hórá, rá. 3one, panchak. Bough, vantú. 3ow, shwák. Зох, nausá, man s**á**. Зоу, kapsan. 3racelet, 3ranch, (tree), pan kang. zú. Brandy, án. Bread, kan sá há. Breakfast, vin. Breeze, rang vin le. sky wind makes. ha (lit. earth). Brick, shai. Bridge, hing. Brimstone, pau he, pau hai. Bring, kau. Broad, pak. Broken. shwa sa. Brook, hájá. Broom, átai. Brother, kong ra. Brow. lúí. Butfalo, wild. lúí hing. ve koi. Bug, mai hú, hapang. Bull. van sûng le. To Burn, rúk túá. Burial. pau ká. Bush, pí twák. Butterfly, rú. Cable, An, án. Cake, Calamus, mai hú sá. Calf. shâ. Camphor, Cane, re. ján túá. Cannon, kwá sá. Canoc, kohom. Cap. zi le (lit. dead is). Carcass, ti chóng le. Cascade, (water great is). míá. · Cat, tchóng.

Caterpillar,

Cave, Centipede, Charcoal, Cheap, Cheek, n. Chest, Chicken, Chief, Chillie, n. Chin, Chunga(Bamboo) tube,)) Chrysalis, Claw, Clay, Cloth, Cloud, Coal, Cock, Cold, Come, Cord, Corn, Cost. Cotton, Cough, ('ountenance, Cow, Crab, C'rack, Crag, Creeper, Cricket. Crocodile, Crook, Crossbow, ('row, Cucumber, Cushion, Cut, v. Cymbal, Dagger, Damp, Dance, Dancing, Dark, Darkness, Dart, Daughter, Dawn,

pú soi. mák. ná. navêm, bomzróng. [bird] khá tók. â sa (lit. young vang hum, vang så. hing bú. ká rá. tún. chóng púá. chakin. há. rang shai. ha nak. â pâng. dang. pau hi, pau he. rú. tzá. láhí. pai. áhai le. Lún. mai hú. shán. hak (hak le). há húng. rú ká. do mo. kún kí. kúm. háp. âká. mai kú. káng tai. hut ko, hat ke. sí. bit sa. shún. ázai. ázai le. núk, nak. rang núk le. sky black makes. ná hí. á phe. shom shak.

Equal,

Erect.

Escape, túng tâ. Day, Evening, zí, jí. Dead, na ba. Ever, Deaf. Exact, no le. Dearth, Expanse, zi. Death, tá. Extinguish, Debt. Eye, Deep, zú. tún. Face. mai, lit. flesh. Deer, Fall, há ring. Deity, False, ti chóng le. Deluge, Family, lún pú. Demon, Famine, harang mun nic Fan, Dense, átai. Far, pau há. Depart. Father, ápá. jú dú. Descend, Feast, rang phúm. Dew. mong chai le. Feather, Diarrhœa, Fence. zi, zí le Die, Fern. Dig, há tà le. · kak. shwá tá h**á**. Fever. Dike, hí. Few. po sa há. Dinner. kap ku. Fig, Dish. Fin, ántar le, atai le. Distant, Finger, shwa kun. Ditch, muı. Finish, támuk. Don't, Fire. hí. Dog. há. Firewood, mii (mui le). Done. . Firmament, rang. káhák. Door, Fish, nya. â shú. Dore, ní. Flannel, â pák pong. Drake. ! Flat, ling. Drink, Flea, tsch. zí le. Drown. Flesh, sám. Drum, Flint, rán. l)ry, â pak nú. Duck. Flood, Ear, ná. án, á. Flour, rang ai le. Early, i Flower. há. Earth, Flute, Earthen-ware, páke. hật. Fly, shi le, miti. Earthquake, chia. Foot, sa le. Eat, Footstep, rang phú. Eclipse. Forest, pau. chungh na. Edge, § kan Foul, Eel, lúk. Frog, lú. Fruit, á tí. Egg, há. Fuel, lâ le. Elastic, mún. Fur, chak lo. Elbow, rang tai. Gale. El-phant, loak. A chong. Gander, tam vai.

pau le. hang shang. pang vai. hút zing. man kam. a mut le. dat le. man pai. horiêm. nâ le. rang zêp. mí tú le. â koi. jávát. tak shot. púk ják. nyèk kan. chákí. van (vun). tam kak. mai í. van hong (fire stone). ti chong le. púa, mai pu**a,** toá pit. chiá tíng mán. pan j**ik.**

ká hák.

Gate,

á jóng.

Giant,		mí chóng.
Girl,		shi kú.
Gnat,		mún kau.
Go,		pau lá, pau há.
Goat,		roan.
God,		há ráng,
Gold,		siên.
Good,		mai mai le.
Goose,		â chóng.
Grain,		tzá.
Granary,		púng.
Grass,		hing.
Grasshopper,		do mo.
Great,		chóng.
Grief,		on.
		ta.
Gum,		
Gun,		ján túá. 1
Ganpowder,		kat.
Hail,		jún.
Han,		kú, ko.
Half,		hat (hut le).
Hand,		chak, chák.
Handle,		chang ko.
Hard,		tiák.
Hatchet,		cháng.
Head,		khung.
Heavy,		li le.
Heel,		chidun.
Hen,		â nu.
High,		tang li.
Hill,		hapa.
Hinder,		pai ki.
Hip,		ke rong.
Hoe,		hâ.
Hog,		vák lá,
Honey,		na ti (bee-water).
Hornbill,		ârzi.
		lím.
Hornet,		mán.
Horse,		kám.
Hot,		
House,	,	ham (humm).
Hunger,	{	vok no le.
	•	stomach nothing is.
Hurricane,		rang chai.
Husband,		hasam pa.
Hut,		pam.
Instep,		chi tok.
Iron,	_	ján.
Ivory,	ſ	loák vá.
	ι	elephant tooth.
Jackall,		hian.

Javelin, Jaw, Joint, Jump, Jungle, Kid, King, Kitten, Knee, Knife, Knot, Knuckle, Ladder, Lake, Lance, Large, Lazy, Lead, Leaf, Leech, Leg, Leopard, Lift, Lightning, Lizard, Locust, Long, Loose, Lost, Loud, Low, Mad, Man, Many, Mat, Meat, Medicine, Middle, Miłk, Mire, Mist, Mole, Molasses. Monkey, Month, Moon, More, Mother, Mouth, Mud,

ná. ká. tsá vát. pat. paú. roan sá. vang ham. míá sá. chi kúí. bít sá lúng ká. chakí. chí túng. núánú jí. chí áp aí le. chong, chong le. húrúk. jántáng. pan chak, lit. treehand. vát. chía. tz inák, chánák. pai pau le. rang dung le. hát, hàst, pelo? kak. là le. nai lí. má lí. nı á lúng. hâtàng. bo le. mí. tai hú le. dam. maií. hing. hótán. tzam tí. hátam. rang phúm. tcha tchú, tú pá. nam sing. mai nák. â chang. lênú. á tá. á nú. tún. há tam.

Nail. Narrow, Navel, Neck, Needle. Nest. New. Night, No. North. Nose, Not, Old, Otter. Path, Perpendicular. Pig, Pigeon. Plantain. Point, Pond. Porcupine, Porpoise, Pull. Ouail. Quick, Rain. To Rain, Rat. Raven, Raw, Red. Rhinoceros, Rice, as grain, " husked. boiled. Ripe, River. " small. Road, large, small, " Rock, Roof. Root. Rope, Rum, Rust, Sago, large, Salt,

chakín. tík. súng. dinkú. mat koi. â zap. haz án. rang nak. sky black. man tai le. nga. nákúng man. haz áng. rá rom. lam. á jóng. vák. yâ. nga. júng. tı kut. â zí. te it? lín pau he. â muk. kí kí. rang vat. rang vat le. jú, zú. â lá. áráng. khí. mai nú. tzá. vûng. 82. júm. shwa ko. shwa nú. lum, lum twa. lum nú. lóng. ham tok. pan ting. rú. zú. yán, ján. zók. bám.

Samber deer, Same, Sand. Seed, Sharp, Shell. Short. Shoulder. Shrew. Sick. Silent. Silk, Silver. Sister, Skin, Sky, Sleep, Slip, Small. Smoke. Snake, Soft. Son, Sour. Spear, Spider, Spirit, Squirrel. Star, Stay, Steel. Stone, Stop, Storm. Straight, Straw. Stream, Sunshine, Sweet, Take, Tank. Thick. Thin. Thirst. Thorn. Throat, Thunder. Tiger, Tight, Tobacco,

tchók. tam rí. sák. hâtúng. áná. káptúng. tút, tut le. swa kong. tsá tsú. kak. dáng. shóng. ngúng. á ná. kan. rang. mik nú, mik nu le. zíp, zip le. nan. hí le. van kút. pú. naí. ko sá. tsánam. pá. mák. zú. ú rút. litzú. támúk. iántú. lóng. támůk, zákaí. rang chai le. jang mai. tásá. swáká. rang han. ti. pau tú. tí kút. tat. ák. húk.

húk. dín kú. rang dúng. tchánú, chánú. chuk le. há hing.

To-day,	á ní.	8. a chut, chut.		
Toe,	chíkí.	9. a kú, l		
To-morrow	, nai ní.	10. a bn, bn.		
Tongue,	lé.	Come,	pau hí.	
Tooth,	vá.	Go,	pau la.	
Tough,	kai.	Pull,	lin he.	
Tree,	pan.	Lift,	pai ha.	
Tribe,	nok,	Take,	,, tu.	
Truce,	mimúl.	Bring,	la he, pau he.	
True,	hotzing.	Bring water,	tí la he.	
Unable,	mun tuak.	Bring fire,	va chup hai.	
Vegetable,	súí.	Bring fuel,	he la hai.	
Village,	ting kong.	"	ha pau hai.	
Waist,	khể da.	Bring more,	lá ĥai.	
Wait,	támúk.	Bring men,	mí jen hai.	
Water,	tí.	What's that?	tem áváng?	
Wax,	mú.	What hill?	tem hápá?	
Weasel,	â kan.	What stream?	tem swáka?	
Weed,	pau.	What tree?	tem pan ai?	
Well,	tí kaí.	' What name?	bílám an pú.	
Wet,	kah le.	What's this?	hai tem ai ?	
What?	tem.	, How large ?	ávat chong pú.	
Wind,	vin.	How far?	ávát tá tai pú.	
Wolf,	shán.	, ,,	abat ta.	
Woman,	shí kú.	What making?	tem zing pú?	
Wool,	roan mú.	Why?	tem mók pú.	
W	obak i lo	Where come from	? azang to pia?	
Wrist,	chak ding.	1 33 33 11	tem tung oi pú.	
Yam,	tong.	, Where gone to?	o ma ai o man pú?	
Yes,	tai le.	Are there deer?	mai te chá?	
Young,	ธย์.	Are there fish?	nya te chá?	
1.	e tá, tá.	Yes,-good,	tai le—mai.	
2 .	a ni, ni.	No-bad,	man tai—man mai.	
3.	a jam, jum.	None,	man tai le.	
4.	a li, li.	Cut this,	hut ko.	
5.	a gá, gá.	Throw this rub-		
6.	a rok, rok.	bish away,	avátko vúng va.	
7.	a nat, nut.	Work quick,	kí ki le.	

This is mainly Banpará Nágá. Contiguous tribes often have so many words in common as to be able to converse; while in other cases the differences are so great, that the dialects are mutually unintelligible.

The letter r at end of a word seems rare, so far I have not met a single case, and I am inclined to think it is never used, inasmuch as all Assamese words used by them that so end, have the final r turned into t, as khar (gunpowder) to khat, kapor (cloth) into kaput, &c.

xxxvi S. E. Peal-Vocabulary of the Banpará Nágás. [Appendix, 1873.

The letter s also seems to follow the same rule. In saying mas (fish), they say mat, and got for gos (tree).

Some words are very widely used as 'rang,' which applies to most atmospheric phenomena, and may even be traced in their word for 'god' and 'devil'. Nágá ideas of Divine persons being very limited, the same word that stands for 'devil' also serves for 'god.' Indeed their god at best is a local and generally malignant sprite, who can be propitiated by small presents of eatables.

The word 'mai' is very generally used as prefix to names of animals. The word *good* seems derived from this source, and it is equally suggestive to note that the word for *sweet*, ti, means also *water*.

Generally speaking, Banpará Nágá is as monosyllabic as it can be, and in speech is cut up short and jerky, especially when they are excited.

W

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Main professionist ille cope the security of the copie the stank Historia life in the same.

I have for the last of the second that the contraction of the color of the second of the se

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THE HONORARY SECRETARIES.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science in different parts of Asia, will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease."

SIR WM. JONES.

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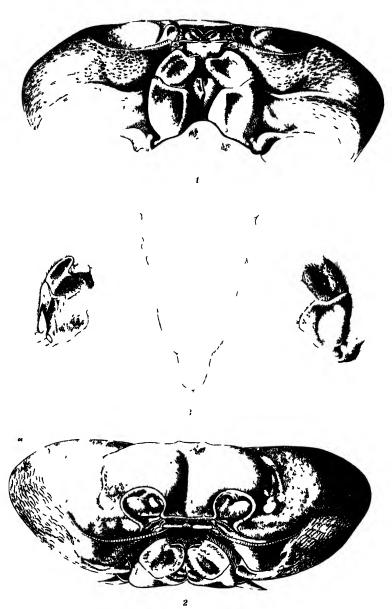
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XVI).

Date of issue of the different numbers of Part II, Journal.

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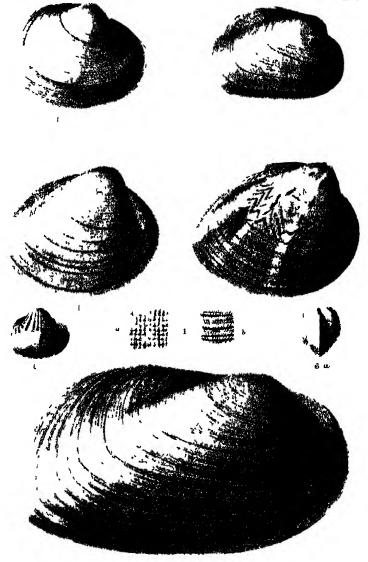


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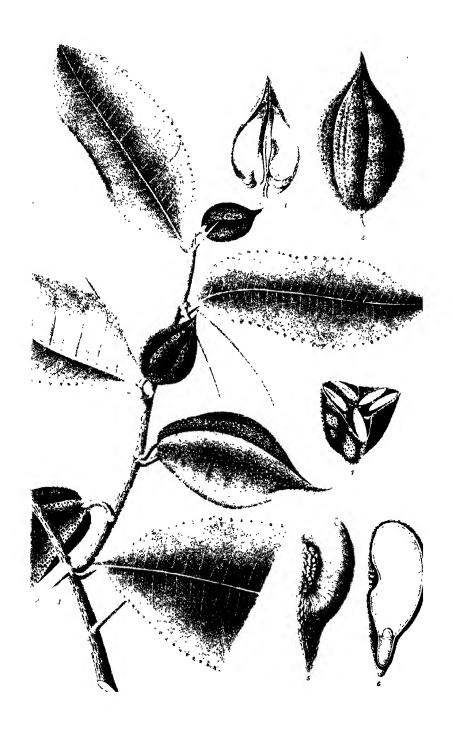
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JOURNAL

OF THE

ASIATIC SOCIETY.

Part II.-PHYSICAL SCIENCE.

No. I.-1873.

On Differential Galvanometers,— by Louis Schwendler.

(Continued from page 152, Vol XLI, Part II, 1872.*)

The first part of this investigation concluded with the following question:

What general condition must be fulfilled in the construction of any differential galvanometer in order to make a simultaneous maximum possible with respect to an alteration of external resistance in either of the differential branches?

To answer this question, it will be necessary to remember, that the condition of a simultaneous maximum sensitiveness at or near balance was expressed by 3 equations, namely,—

$$\frac{(w-g) (w'+g')+f(w+w'+g'-g)}{p (g-w) g'} = \frac{2 (g+w+f)}{2 \sqrt{g} \sqrt{g'-p} (g+w)} \cdots \text{ II.}$$

$$\frac{(w'-g') (w+g)+f(w+w'+g-g')}{p} = \frac{2 (g'+w'+f)}{2 \sqrt{g} \sqrt{g'-g'+w'}} \cdots \text{ II.}'$$

and

• Read before the Asiatic Society of Bengal, 6th March, 1872.

Louis Schwendler-On Differential Galvanometers.

No. 1,

Additional remarks.

In the foregoing it has not been shewn that the values g and g', expressed by equations a and b, must necessarily correspond to a maximum sensitiveness of the differential galvanometer, because it was clear a priori, that the function by which the deflection is expressed is of such a nature that no minimum with respect to g and g' is possible. However, to complete the solution mathematically, the following is a very short proof that the values of g and g' really do correspond to a maximum sensitiveness of the differential galvanometer under consideration.

Reverting to one of the expressions for the deflection a° which any differential galvanometer gives before balance is arrived at, we had:

 $a^{\circ} \propto K \frac{\sqrt{g}}{N} \Delta$ and as the increase of deflection at or near balance is

identical with the deflection itself, and further as the law which binds the resistance of the differential coils to the other resistances in the circuit, in order to have a maximum sensitiveness, is of practical interest only when the needle is at, or very nearly at, balance, we can solve the question at once by making a° a maximum with respect to g and g', if we only suppose Δ constant and small enough, and as K is known to be independent of g and g',

the deflection a^0 will be a maximum if $\frac{\sqrt{g}}{N}$ is a maximum for any constant Δ (zero included).

Further we know that g' = Cg which value for g' in N substituted will make the latter a function of g only and consequently $\frac{\sqrt{g}}{N}$ also. We have therefore to deal with a single maximum or minimum, and according to well-known rules we have:

$$\frac{da}{dg} = \frac{N - 2g \frac{dN}{dg}}{2\sqrt{g} N^{s}} = \frac{U}{V}$$

and

$$\frac{d^3a}{da^3} = \frac{V\frac{dU}{dg} - U\frac{dV}{dg}}{V^3}$$

but

$$\frac{da}{dg} = 0 \quad \text{it follows that} \quad U = 0$$

$$\therefore \qquad \frac{d^2a}{dq^2} = \frac{1}{V} \frac{dU}{dq}$$

Now '

$$\frac{d\mathbf{U}}{dg} = -\left(\frac{d\mathbf{N}}{dg} + 2g\frac{d^2\mathbf{N}}{dg^2}\right), \text{ but } \frac{d\mathbf{N}}{dg} \text{ as well as } \frac{d^2\mathbf{N}}{dg^2} \text{ being invariably positive, it follows that } \frac{d\mathbf{U}}{dg} \text{ is invariably negative, and as further V is always positive it follows finally that } \frac{d^2a}{dg^2} \text{ is always negative, or the value of } g \text{ obtained by equation } \frac{da}{dg} = 0 \text{ corresponds to a maximum sensitiveness of the second$$

differential galvanometer. In a similar way it can be shewn that the value of g' obtained by equa-

tion $\frac{da}{da'} = 0$ corresponds also to a maximum sensitiveness of the differential galvanometer.

This is in fact a second and far more simple solution of the problem. However, it is by no means as general, nor does it adhere as closely to the spirit of analysis as the first more complicated solution.

Effect of Shunts. -It is clear that the introduction of shunts cannot alter the general results as given in equations a, b, c, and d, as long as the shunts are used merely for the purpose of carrying off a fixed quantity of current without in themselves having any direct magnetic action on the needle.

However, to avoid misunderstanding, it is well to remember that in the case of shunts being used, the values to be given to w and w' in the above equations are not those at which balance actually arrives, but those at which balance would arrive if no shunts were used, i. e., the resistance at which balance is established when using shunts must be multiplied by the multiplying power of their respective shunts, before they are to be substituted in the equations a, b, c and d.

Mechanical arrangement designed by p.—The condition which must be fulfilled in the construction of any differential galvanometer to make a simultaneous maximum sensitiveness possible was expressed by

$$p^{\circ} = \frac{w'}{w} \qquad \qquad o.$$

while $p = \frac{m'n'}{mn}$ and it will be now instructive to enquire what special physical meaning equation c has.

By m was understood the magnetic effect of an average convolution (i. e. one of average size and mean distance from the magnet acted upon, when the latter is parallel with the plane of the convolutions) in the differential coil of resistance g, when a current of unit strength passes through it. Similarly m' was the magnetic effect of an average convolution in the other differential coil of resistance g'.

Further n and n' were quantities expressed by

$$U = n \sqrt{g}$$

$$U' = n' \sqrt{g'}$$

and

U and U' being the number of convolutions in the two coils g and g' respectively.

Now we will call A half the cross section of the coil g (cut through the coil normal to the direction of the convolutions) and which section, as the wire is to be supposed uniformly coiled, must be uniform throughout.

Thus we have generally

$$\frac{A}{c(q+\delta)} = U$$

wherever the normal cut through the coil is taken.

c is a constant indicating the manner of coiling, either by dividing the cross-section A into squares, hexagons or in any other way, but always supposing that however the coiling of the wire may have been done, it has been done uniformly throughout the coil. (This supposition is quite sufficiently nearly fulfilled in practice because the coiling should always be executed with the greatest possible care, and further the wire can be supposed practically of equal thickness throughout the coil).

q is the metallic section of the wire, and δ the non-metallic section due to the necessary insulating covering of the wire.

Further we have

 $g = U \frac{b}{q\lambda}$ where b is the length of an average convolution and λ the absolute conductivity of the wire material supposed to be a constant for the coil.

• Now, for brevity's sake, we will suppose that δ , the cross-section of the insulating covering, can be neglected against q the metallic cross-section of the wire.

Consequently we have

$$\frac{\mathbf{A}}{cq} = \mathbf{U}$$
 (approximately)

and

$$g = U \frac{b}{q\lambda}$$
$$\therefore U = \sqrt{\frac{A\lambda}{bc}} \cdot \sqrt{s}$$

or
$$n = \sqrt{\frac{\overline{A}\lambda}{bc}}$$

similarly $n' = \sqrt{\frac{\overline{A'\lambda'}}{b'c'}}$
 $\therefore \frac{n'}{n} = \sqrt{\frac{\overline{A'\lambda'}bc}{\overline{A}\lambda b'c'}}$

But using wire of the same conductivity in both the differential coils, which should be as high as is possible to procure it, and further supposing the manner of coiling to be identical in both coils, we have

$$\lambda = \lambda'$$

$$\therefore \frac{n'}{n} = \sqrt{\frac{\overline{A'} \cdot \overline{b}}{\overline{A'}}}$$

Further we know that if the shape and dimensions of each coil are given, and in addition also their distance from the magnet acted upon, it will be always possible to calculate m and m', though it may often present mathematical difficulties, especially if the forms of the two coils differ from each other and are also not circular. This latter condition is generally necessitated in order to obtain the greatest absolute magnetic action of each coil in as small a space as possible.

However it is clear that we may assume generally that the two coils have each an average convolution of identical shape and of the same length, placed at an equal distance from the magnet acted upon, and that therefore the magnetic action of each coil is dependent on the number of convolutions only.

In this case we have evidently

$$m = m'$$

$$b = b'$$

$$\frac{n'}{n} = \sqrt{\frac{A'}{A}}$$
and as $p = \frac{n}{n} \cdot \frac{m}{m}$
we have finally
$$\frac{A'}{n} = \frac{w'}{n}$$

Equation e shows at once that under the supposed conditions, i. e., when the average convolutions in each coil are of equal size and shape, the wire used in either coil is of the same absolute conductivity, and that the thickness of the insulating material can be neglected against the diameter of the wire:

The wire used for filling each coil must be invariably of the same diameter, otherwise a maximum sensitiveness is impossible.

How the above simple law expressed by equation e would be altered, when the given suppositions were not fulfilled, must be found by further calculation, but as the latter is intricate and a more general result is not required in practice, I shall dispense at present with this labour.

Special Differential Galvanometers.—Here shall be given the special expressions to which the general equations a, b, c and d, are reduced when certain conditions are presupposed.

1st case.—When w and w', the two resistances at which balance is arrived at are so large that f, the resistance of the testing battery can be neglected against either of them without perceptible error. Substituting therefore f = 0 in equations a, and b, we get:

and the other two remain as they are namely:

$$p^2 = \frac{w'}{w}$$
 ... c. $C = \frac{w'}{w}$... d.

2nd case.—When the battery resistance f cannot be neglected against either w or w', but when the two resistances at which balance is arrived at are invariably equal.

Thus substituting in the general equation

$$w = w' = w$$

we get

$$g = g' = g = -\frac{w+f}{3} + \frac{1}{3}\sqrt{4 w^2 + 8fw + f^2} \dots a, b.$$

$$p^2 = 1 \dots c.$$

$$C = 1 \dots d.$$

3rd Case. When the conditions given under 1 and 2 are both fulfilled

or
$$w = w' = w$$

and $f = 0$

then we have

The very same result which was obtained by direct reasoning at the beginning of this paper. Applications.—Though the problem in its generality has now been entirely solved, it will not perhaps be considered irrelevant to add here some applications.

For our purpose differential galvanometers may be conveniently divided into two classes, viz., those in which the resistances to be measured vary within narrow limits, and those where these limits are extremely wide.

To the first class belong the differential galvanometers which are used for indicating temperature by the variation of the resistance of a metallic wire, exposed to the temperature to be measured. As for instance, C. W. Siemen's Resistance Thermometer for measuring comparatively low temperatures, or his Electric Pyrometer for measuring the high temperature in furnaces.

It is clear that for such instruments the law of maximum sensitiveness should best be fulfilled for the average resistance to be measured, which average resistance under given circumstances is always known.

To the second class belong those differential galvanometers which are used for testing Telegraph lines, at present the most important application of these instruments. In this case each differential coil should consist of separate coils connected with a commutator in such a manner that it is convenient to alter the resistance of each coil according to circumstances, i. e., connecting all the separate coils in each differential coil parallel, when the resistances to be measured are comparatively low, and all the separate coils consecutively, if the resistances to be measured are high, &c., &c., fulfilling in each case the law of maximum sensitiveness for certain resistances, which are to be determined under different circumstances differently, but always bearing in mind that it is more desirable to fulfil the law of maximum sensitiveness for high resistances, when the testing current in itself is obviously weak, than for the low resistances.

An example will shew this clearer. Say for instance a differential galvanometer has to be constructed for measuring resistances between 1 and 10,000. A Siemen's comparison box of the usual kind $\left(\frac{1}{10,000}\right)$ being at disposal, it will be convenient and practical to decide that the two differential coils should be of equal magnetic momentum, from which it follows that C as well as p must be unity, or in other words that the two coils must be of equal size, shape and distance from the needle, and must also have equal resistances, i. e., must be filled with copper wire of the same diameter. The resistance of each coil is then found by

$$g = -\frac{w+f}{3} + \frac{1}{3} \sqrt{\frac{1}{3} w^2 + 8f w + f^2}$$

where f is the resistance of the battery and w a certain value between

1 and 10,000, the two limits of measurement. The question now remains to determine w.

It is clear that the law of maximum sensitiveness has not to be fulfilled for either limit, because they represent only one of the 10,000 different resistances which have to be measured, but it is also clear that to fulfil the law for the average of the two given limits would be equally wrong, inasmuch as the maximum sensitiveness is far more required towards the highest than the lowest limit. We may assume, therefore, that it is desirable to fulfil the law for the average of the average and the highest limit, which gives

$$w = 7500$$

against which the resistance of the battery may always be neglected.

Consequently we have

$$g = \frac{w}{3} = 2500$$

for each coil.

Now if the coil be small, and consequently the wire to be used for filling it is thin, the value g = 2500 wants a correction to make allowance for the thickness of the insulating material, by which g becomes somewhat smaller.*

Before concluding I may remark that the question of the best resistance of the coil, when the resistance to be measured varies between two fixed or variable limits, can be solved mathematically by the application of the Variation Calculus.

* These expressions for g and g' must be corrected, if the thickness of the insulating covering of the wire cannot be neglected against its diameter. The formula by which this correction can be made was given by me in the Philosophical Magazine, January, 1866, namely

corrected
$$g = c g \left(1 - 4 \sqrt{g m^2}\right)$$

where g = the resistance to be corrected and expressed in Siemen's Units,

and
$$m = \delta^4 \sqrt{\frac{c \pi \lambda}{AB}}$$

7 = radial thickness of the insulating covering expressed in millimetres.

• c = a co-efficient expressing the arrangement adopted for filling the available space uniformly with wire. Namely, if we suppose that the cross section of the coil, by filling it up with wire, is divided into squares we have c = 4, if in hexagons c = 3.4. &c., &c.

 $\lambda =$ absolute conductivity of the wire material (Hg = 1 at freezing point).

A = half the section of the coil in question when out normal to the direction of the convolutions, and always expressed in square millimetres.

B = length of an average convolution in the coil, and expressed in metres.

On the land-shells of Penang Island, with descriptions of the animals and anatomical notes; part second,* Helicacea,—by Dr. F. Stoliczka.

[Read and received 7th August, 1872.]

(With plates I to III.)

In this group of pulmoniferous land-shells I shall notice twenty three species, belonging to the Zonitidæ, Helicidæ, Bulimidæ, Clausiliidæ, Philomycidæ, Pupidæ, Streptaxidæ, Veronicellidæ and Vaginulidæ. The majority of the species are new, except a few previously described from the neighbouring country, and on one or two of such commonly distributed species, as are Stenogyra gracilis or Ennea bicolor.

Nearly all the species had been collected with the animals living, and I have spared no pains in order to make the detailed anatomical account as complete, as it appears desirable for a correct generic determination.

I scarcely need to mention, that on the whole the fauna is characteristically Malayan, the same fauna which extends from the Philippine islands through Burma and Arakan into the warm valleys of Sikkim. In the plains of Bengal it mixes with the Indian fauna proper.

I cannot help repeating the urgent request to my conchological friends in India, that they may favour me with live specimens of the species of shells occurring in their neighbourhood. In the *Helicacea* especially, the anatomical characters are indispensable for a correct generic determination, and without this it will not be possible to obtain a natural arrangement of our terrestrial Mollusca.

Fam. Zonitides.

RHYSOTA† CYMATIUM, (Benson). Pl. i, figs. 1-3 and pl. ii, figs. 13-15.

Helis Cymatium, Benson, apud Pfeiffer, Novit. Conch. I, p. 58, pl. xvii, figs. 1-2.

Penang specimens, which slightly differ in the height of the spire, (see figs. 1-3, pl. i,) agree in almost every point of structure with the type shell, described by Pfeiffer from Lancavi, a small island situated a few miles north of Penang. The increase of the volutions is in both exactly the same, the upper side of the whorls is marked with fine oblique rugosities, the lower is spirally striated; in fresh specimens the former is silky brown, the lower olivaceous brown, the inside of the aperture is in full grown specimens cover-

- * Continued from J. A. S. B., for 1872. Vol. XLI, pt. ii, p. 271.
- † Albers, Heliceen, edit. E. v. Martens, p. 54.

ed with a kind of a nacreous callose layer. The only noticeable difference consists in the narrowness of the umbilicus, its width being in all the Penaug specimens, which I obtained, about one twelfth of the diameter of the shell, while in Benson's type it is only one seventh of the same diameter.

The species is found all over Penang hill from elevations of about 300 to 2500 feet, and both on the ground as well as on trees, but chiefly on the latter; it is, however, not common, and adult shells are indeed extreme rarities.

The closely allied Rh. densa, (Adams),* only differs by a slightly smaller number of whorls, the last being much wider. Rh. Chevalieri, (Souleyet), differs in the same character, though it has the umbilious of exactly the same size as the Penang variety of cymatium.

The animal is stout and rather short, its total length being less than twice the diameter of the shell; the posterior part of the body is the shorter one, and above rather sharply ridged; it ends with a large gland and a projecting horn above it. The whole body is uniform more or less dark brown, laterally strongly warty and obliquely grooved; the pedal row is very distinctly margined on both sides with an impressed line, and the margin of the foot below it is broad, smooth, marked with alternately brown and pale oblique stripes, so as to give the appearance of a variegated fringe. The eye peduncles and tentacles are of usual proportionate length, dark brown or even blackish, the latter with pale tips. On the whole, the general colour of the specimens varies a great deal; the young are mostly pale brown with an olivaceous tinge, while in old ones the neck, including the head and pedicles, become almost black.

The mantle is somewhat paler than the body, its edge moderately thickened. There are two small linguiform shell-lobes present, a right one, just below the inner or posterior angle of the aperture of the shell, thus playing on the inner lip, and producing its moderately distinct nacreous and callose structure. The other lobe lies below the outer periphery of the shell on the basal side; it projects from the outer end of a rather elongated very narrow fringe, which is separated from the edge of the mantle itself. The right necklobe is entire, thick, rounded, somewhat freely projecting at the lower or umbilical end. The left neck lobe is divided in two portions, the upper elongately rounded, the lower much narrower, with the upper end somewhat pointedly extended. The edge of the mantle which secretes the umbilical margin of the peristome is internally considerably thickened, (comp. pl. ii, fig. 13).

I have not been able to see satisfactorily the exact structure of the genital system, but, as far as it could be examined, it appears almost entirely to agree with that of *Rhysota semiglobosa*, figured by Semper. There certainly are no appendages present—neither on the penis, nor on the seminal duct or uterus.

E. v. Martens, Ost-Asiat. Expedit. p. 230, pl. 10, fig. 1.

The jaw is smooth, semilunar, with a round projection in the middle of the concave edge; it is about 2.5 m.m. broad.

The radula is comparatively of very great length. In a middle-sized specimen it measured 7 m.m. in length and 3 m.m. in breadth, although one of the ends was not quite perfect. I counted 106 transverse rows and about 141 teeth in each row. The centre tooth has a comparatively short point without any lateral denticles, and is somewhat smaller than the adjoining laterals. The first of these has a long, laterally bent, rather blunt projection; the following very gradually decrease in size and the middle cusp becomes gradually more pointed and curved, while the basal plate decreases. With about the fiftieth tooth the end begins to become bicuspid, and on about the hundreth tooth on either side, the two cusps are sharpest and best developed.

Semper (Reisen im Archipel der Philipp., Vol. III, p. 68) says that Rhysota does not possess any developed shell lobes of the mantle. In the present species their existence is undeniable, and still all the other characters of the animal and shell point towards the greatest relation of R. cymatium to other typical species of the genus, which scarcely would have any meaning, if it were restricted in the sense given to it by Semper. I very much doubt, that all the species with polished lower surface of the shell, referred by Semper to Rhysota, have no shell-lobes. How then do they produce the smoothness of the shell? I generally found shell-lobes essential for that purpose. But supposing some of the species really had no shell-lobes, this would be no sufficient reason for excluding any other species which possess them from Rhysota; for in Xesta we have a similar mixture of forms with and without shell-lobes.

Thus the only anatomical difference, which remains to be considered as distinguishing Rhysota from Xesta, is the simple form of the genital organs in the former. How far this character is really reliable for generic distinctions, is a point by no means easily settled, as I had already occasion to notice when speaking of the anatomy of the two species of Sitala (Conulema, olim) (Journ. A. S. B., Vol. xl, Pt. ii, 1871, p. 236 &c.), S. attegia and S. infula.

When we compare the characters relating to the presence or absence or form of the mantle lobes, we meet with a perfect similarity between Rhysota and Rotula. The distinction between the two merely rests in the presence of an amatorial gland in the latter genus, while the shells only differ in the upper side of Rhysota being irregularly corrugated, and in Rotula reticulately striated, or transversely costulated.

In speaking of the shell of *Rhysota*, Albers gives the peculiarly rugose upper surface as one of the most important characters of the genus.

ROTULA* BIJUGA, n. sp., Pl. i, figs. 4-7 and pl. ii, figs. 16-18.

R. depresse conoidea et suborbiculata, vel late conica, angustissime umbilicata, tenui, cornea, pallide succinea; anfractibus 5:5 ad 6:5, suturâ simplici, suprâ rare filiforme marginata, junctis, lente accrescentibus, in superficie superiore convexiusculis, costulis transversis obliquis, confertis, striis spiralibus confertissimis ac plus minusve distinctis intersectis, crispatulis seu subgranulosis, ornatis; ultimo ad peripheriam acute carinato, ad basin modice inflato, nitido, sublevigato, striis incrementi radiantibus atque alteris spiralibus sub-obsoletis notato, medio cancaviusculo; apertura angulatim semilunari, paulum obliqua, labio tenuissimo vix distinguendo, labro ad marginem tenui, neque expanso, neque incrassato, ad insertionem umbilicalem brevissime reflexo instructa.

Dimensiones varietatum frequentium :-

am	ı. major.	D. minor.	Alt tests.	Alt. aperturæ.	Lat. aperturæ.
a.	14.5	1 3·5	11 0	6.0	7.6 m.m.
ъ.	16.2	15·0	10.9	6.6	8.2 "
c.	17.4	15.6	12.0	7.2	9.2 ,,
d.	17.4	16.0	10.9	7.0	9.0

Diam. maj. speciminis maximi 18.8 m.m.

It will be seen from the above measurements, which are taken from the four figured specimens, that the height of the shell is very variable, but the increase of the whorls is very nearly quite constant. The upper convexity of the whorls also slightly varies; the sides of the spire are generally nearly straight, more rarely conspicuously convex; occasionally the peripherical keel is somewhat projecting above the suture. The ornamentation is characteristically that of Rotula, reticulately sculptured above, nearly smooth below. The transverse ribs on the upper surface are traversed by fine spiral lines, which generally only produce a slight undulation in the direction of the ribs, sometimes, however, a fine granulation is formed. As regards form, the present species very closely resembles the Burmese R. anceps, (Gould), and also the South Indian R. Shiplayi, the first has, however, the upper costulation very fine and no spiral striæ, while the latter has both much stronger developed, producing a granular surface, and the shell is also more solid. The third very closely allied species is R. indica, differing principally by a greater width of the last whorl, and also by a stronger sculpture.

• Comp. Journ. A. S. B., 1871, Vol. xl, pt. ii, p. 231. The name Rotula has also been applied in the ACTINOZOA, but if our scological classification should make such rapid progress, as it has done lately, it will, I think, in no long time be almost impossible to find new names for the generic groups, and we shall be forced to modify the existing rules at least so far that the same name may become reapplicable in at least the five or six principal divisions of the animal kingdom. A further relaxation of the rule would scarcely prove beneficial and would hardly be necessary.

The animal of the Penang species, when fully extended, equals in length about twice the longer diameter of the shell; back roundly flattened above, foot posteriorly obtusely ridged, terminating with a large gland which is superseded by a small horn; pedal row very distinct and the edge of foot below obliquely The general colour of the body is pale or livid grey, with a general reddish tinge when full grown. A pale yellow (in young), or more or less distinctly cinober red (in adults), stripe extends along the centre of the back and the superior ridge of the foot, the former is bounded on each side by a broad black stripe, originating at the base of each peduncle and continuing to the mantle, and below this stripe there is again a yellowish or red line. The posterior red band is only edged with black. The sides of the foot, both anteriorly and posteriorly, are more or less distinctly variegated with impure black and tinged with red; front of head between the two pedicles and tentacles with a black spot; pedicles and tentacles generally greyish, the latter with a reddish tinge, and with pale, rather large, globular tips, the former with a black ring at the base where the longitudinal black bands begin.

The mantle is moderately thickened. The right shell lobe is entirely obsolete, or only indicated by a very slight extension of the edge, a short distance below the upper angle of the aperture of the shell. Sole of foot divided by a longitudinal groove. The right neck lobe is large and extends as a moderately-broad fringe to near the retractor muscle where it terminates with a free end. The left neck lobe is smaller with a linguiform free outer end. The left outer edge of the mantle is externally also entire, like the right one, but about the middle of the basal portion it has internally a distinct lobe, about 2 m.m. in length, which in its situation strictly speaking lies between the shell and the neck lobe; but as it becomes reflected with its edge over the shell, it has to be regarded as the representant of the left shell lobe. The lower portion of the left neck lobe is only a thickened swelling, extending as a narrow inner rim of the edge of the mantle to near the umbilicus. Both the right and left neck lobe have a large black spot, in continuation of the lateral black bands of the back.

The general anatomy does not differ in any essential point from that of *R. anceps*, as briefly noticed by me in Journ. A. S. B., Vol. xl, pt. II, 1871, p. 233, pl. xvii, fig. 1.

The jaw is semilunar, perfectly smooth, with obtusely rounded corners, and a slight rounded projection in the centre of the concave edge; it is about 1.5 m.m. bapad.

The length of the radula is about 4.5, and its breadth above 1.5 m.m.; it is composed of about 105 transverse, nearly straight rows of teeth, there being about 121 teeth in each row. The form of the teeth again very closely resembles that of *Rot. anceps*, (loc. cit.). All the points extend beyond the upper edge of the basal plate; the central is somewhat widened below

the terminal point, contracted in the middle, but it has no distinct denticles at the sides. The laterals gradually become more and more turned, and curved, with a small inner and scarcely a trace of an outer denticle; up to the 20th they very gradually diminish in size, then a very slight break follows, the 21st being somewhat sensibly smaller and first distinctly bicuspid at the tip, while at the same time the size of the basal plate has much diminished, until in the last teeth it almost entirely becomes obsolete; the two terminal cusps on the other hand become gradually more and more equal.

The genital organs have a distinct amatorial gland, possessing near its origin a large globose appendage, internally composed of an elliptical largely cellular mass, in which the cells are concentrically arranged with their longer diameter perpendicular to the walls of the ellipse. The posterior part of the gland is filled with a finely granular substance,—probably calcareous particles. The vas deferens has only one slight enlargement about the middle of its length; it consisted in a simple thickening of the walls, but I could not trace any calcareous particles in it. Towards the end, where the penis is lodged, the tube is widest and somewhat curved, but there are no other appendages, or calcareous sacs accompanied with a flagellum, present, such as have been observed in many other species of Rotula.

SITALA* CARINIFERA, n. sp. Pl. i, fig. 8.

Testa globose conoidea, cornea, apice obtusula, angustissime perforata; anfractibus quinque, gradatim accrescentibus, convexe angulatis, sutura simplici junctis, transversim minutissime striolatis, superis infra medium carinis filiformibus duobus ornatis, ultimo ad peripheriam tricarinato, basi planate convexiusculo, lævigato; apertura semilunari, verticali, non descendente, labro extus tenuissimo, in regione columellari paululum reflexiusculo.

Diam. maj. 2.2, minor 2., alt. testes 2. m. m.

Hab.—'Penang hill,' in foliis Coffee arabica, specimen unicum.

The animal of this species is exactly like that of S. infula, figured in pl. xviii, in J. A. S. B., Vol. xl, Pl. ii, for 1871; it has a generally pale brownish grey colour; but having obtained a single specimen, I did not like to sacrifice the shell, in order to notice the internal structure; for when examining these little species one is by no means sure, that he will obtain from a single specimen an insight into the whole anatomy.

The present species is closely allied to the Nilgheri *Helix tricarinata*. Blf., which is also a *Sitala*, and differs by a more depressed and broadly conical shape, and by having a much wider umbilicus.

^{*} H. Adams proposed this name for Heliv infula, Bens., as type (P. Z. S. for 1865, p 408) I had unfortunately overlooked this reference, when I proposed for Benson's attegia (and infula and a few others) the name Conulema, which must now be regarded as identical with situla (J. A. S. B., xl, pt. II, p. 286.)

MACROCHLAMYS* STEPHOIDES, n. sp. Pl. i, fig. 9, and pl. ii, figs. 19-20.

M. orbiculata, spira depresse convexiuscula, basi medio concaviuscula, angustissime perforata, tenui, succineo cornea, unicolore, circa umbilicum albescente; anfractibus sex, lentissime accrescentibus, sutura lineari junctis, infra suturam angustissime adpressis, nitidis, fere politis, striis incrementi transversis minutissimis, nonnunquam fere omnino obsoletis, notatis, supra convexiusculis; ultimo ad peripheriam fere uniforme convexo; apertura subsemilunari, vix obliqua, labio per-tenui, labro simplici, ad basin paulum sinuose producto, ad insertionem umbilicalem anguste atque breviter reflexo. Diam. maj. 11.6, d. min. 10.7, alt. 7; alt. apert. cum perist. 4.8, ejusdem lat. 5.6 m.m.

The nearest ally of this species, as regards general character and size, is the Andamanese *Macroch. stephus*,† (Benson), differing from the present species by a somewhat more depressed form and by having the sides of the spire nearly straight or slightly concave, but not convex. *Macroch. hyalina*,‡ Martens, is also very closely allied, it is a larger shell and with a more rapid increase of the volutions, the difference between the smaller and larger diameters being 2.5 m.m. In Burma and Sikkim several other allied forms occur, such as *M. hypoleuca*, patane, petasus, &c., but they are all smaller and more depressed shells.

The species is rare; I found a single live specimen and half a dozen of old shells at the base of Penang hill, about 300 feet.

The animal is long and very slender, blackish grey above and on the pedicles, paler at the sides of the foot, which has a long and thin horn above the tail gland. Both shell and neck lobes are well developed, the right ones larger than the respective left ones. The two shell lobes are linguiform, and the right one, when fully expanded, covers almost half of the upper surface of the shell. The lower portion of the left neck-lobe is merely represented by a slightly thickened rim, extending from the place of insertion of the left shell-lobe to near the umbilicus.

The jaw is one mill. broad, with a central rounded tooth in the concave edge and with the corners somewhat bent outwardly; a form which is also mot with in several other species of *Macrochlumys*.

The radula has not been seen perfect, but it does not appear to have been more than four mill. long, and there appear to have been at least 101 teeth in each transverse row; all with very sharp points; the central with

Comp. Journ. A. S. B., vol. xl, pt. ii, 1871, p. 246.

⁺ The figure of this species in Conch. Ind., pl. 62, is taken from a young or imperfect specimen, in which the peculiarly depressed form is not so well discernable as in an adult shell. Fig. 6 on the same plate is incorrect, because it does not shew the sinusely produced median basal portion of the peristome.

[†] Preuss. Exped. nach Ost Asien, II, p. 241, pl. 12, fig. 5.

a distinct denticle on either side, and the last laterals with two small unequal cusps; all have the basal plate obtusely narrowed outwardly.

The genital organs are very similar to those of *M. indicus*, Benson, but much more slender; the amatorial gland is very thin (in a young specimen), there is a small cocal appendage on the vas deferens, and a flagellum at the base of the penis, just before a swelling filled with calcareous particles.

MICROCYSTIS* PALMICOLA, n. sp. Pl. i. fig. 10.

M. testa late conica, tenui, cornea, angustissime umbilicata; anfractibus quinque, gradatim accrescentibus, convexiusculis, sutura simplici junctis, supra splendore albide sericino, transversim oblique, minutissime atque confertissime, striolatis, ultimo ad peripheriam acute angulato; basi convexiuscula, olivaceo nitita; apertura subsemilunari, extus angulata, obliqua; labro tenui, simplici, ad basin recedente, ad umbilicum reflexo; labio tenuissimo, vix distinguendo. Speciminis maximi diam. maj. 2.8, d. minor 2.6, alt. 2.2, diam. apert. 1.7, ejusd. alt. 0.95 m.m.

Hab.—Penang, sub corticem Coccos nuciferæ, haud frequens.

The shell is distinguished from allied species by its comparatively sharply angular last whorl, slightly inflated base and by the peculiar silky and very finely striated upper surface.

The animal when fully extended equals in length about four diameters of the shell; it is rather dark brownish grey, darkest on the tentacles and on the rostrum; posterior gland superseded by a small horn.

Helicarion† permolle, n. sp. Pl. i, fig. 11 and pl. ii, figs. 21-23.

H. testa depresse inflateque conoidea, tenuissima, fere membranacea, translucente, pallide lutescente, vix perforata, spira ultimo anfractu multo breviore; anfractibus 4.5, rapide accrescentibus, ad suturam simplicem adpressis, nitidis, convexiusculis, ultimo inflato, ad peripheriam rotundato, transversim lente arcuateque striatulo, ad basin striis spiralibus sub-obsoletis notato; apertura lunari, valde obliqua, labio albescente, minutissime puncticulato, labro tenuissimo, simplici, ad basin valde recedente, ad marginem interiorem umbilici breviter reflexiusculo. Diam. maj. 8.4, d. min. 7.4, alt. 6.3; alt. apert. cum perist. 4, ejusd. lat. 4.3 m.m.

The rather strongly elevated spire, and the membranaceous and transparent structure of the shell, separate this species from the numerous allied forms of the Philippines. The species is rare; I only obtained about half a dozen specimens on low bushes or between old vegetable matter on the ground, about 500 feet above the sea, on Penang hill.

Microcystis, Beck. Comp. Semper in Reis. Arch. Philipp., pt. II, vol. iii, 1870,
 p. 43, and Stoliczka in J. A. S. B., vol. xl, pt. II, p. 251.

[†] Semper, Reisen Archip. der Philippinen, vol. iii, p. 20.

The animal is slender and very long; when fresh the extended foot is three times the longer diameter of the shell, which is then entirely covered by the mantle; but in captivity the shell lobes shrink very rapidly, being reduced to narrow linguiform appendages. Middle of back and of the hind foot whitish or very pale brownish, with a slight pinkish tinge; a broad blackish band runs from each pedicle along the sides of the whole back, and also on the sides of the posterior part of the foot, as far as the terminal gland, which is superseded by a very distinct pointed horn; the dark colour extends down to the pedal row, while a large black spot about the middle of the foot on each side reaches down to the sole; pedicles long, grey; tentacles short and almost white; mantle blackish with small whitish dots. All the four mantle lobes are well developed, the left shell and neck lobes are proportionately somewhat larger than the corresponding right ones, and each of the former has a deep but narrow incision in its lower portion.

The jaw is about one mill. broad, quadrant shaped, smooth, without any projection in the centre of the concave edge, like in most other species of the genus.

The radula is moderately broad and nearly 2.5 m.m. long; there are 95 transverse rows and about 121 teeth in each row, all remarkably small and from the tenth tooth they somewhat rapidly decrease in size towards the edges. The centre tooth has two distinct denticles on either side and a third much smaller one nearer to the base; the principal cusp is pointed. On the subsequent teeth the inner denticles disappear first, and gradually altogether, then the lower outer, while the upper outer remains, until at last it equals the principal cusp, so that the outermost teeth become almost regularly, though shortly, bicuspid.

The general anatomy does not offer any peculiarity requiring special notice. The nervous and digestive apparatus agrees with that of other ZONITIDE, except perhaps that the liver is enormously largely developed. The female portion of the genital system has a long sub-pedunculate receptaculum seminis, branching off at its origin. The vas deferens is very short, passing into a rather widened tube, again somewhat contracted near the base of the penis, which is attached by a special strong muscle. The end of the penis widens very rapidly for a short distance before it joins the hermaphrodite opening. I have not observed, in two specimens examined, any cocal or calciferous appendages.

Genus. TROCHOMORPHA, Albers.

Heliceen, Edit. E. v. Martons, p. 60, and Preussiche Exped nach Ost Asien vol. ii, Landschnecken, 1867, p. 245; Nigritella and Villena, ibidem. Sivella, Blanf.

The type of this genus is *Helix trochiformis*, Fèr., which is characterised by a moderately solid, sub-discoid or depressedly conical shell, the whorls being flattened above, the last carinate at the periphery, the aperture rhombiform or narrowly semilunar with simple sharp edges, but the columellar lips occasionally internally somewhat thickened and slightly reflexed.

I do not know whether the animal of this typical species had been examined, but I have observed those of about a dozen different species, which evidently belong to the same type, and I find that all of them possess a very fine glandular slit at the upper end of the foot, the pedal row being in all also distinct; they have, therefore, to be referred to the ZONITIDE, as already noticed in my paper on the Moulmain shells in Jour. A. S. B., vol. xl, pt. 11, 1871, p. 225.

Judging from a somewhat more intimate examination of the animals of a few species, the following characters have to be added to those derived from the peculiar shape of the shell.

Animal moderately slender, with the posterior part of the foot shorter than the anterior, the former terminating above with a small glandular slit; pedal row distinct; mantle with elongated narrow neck lobes, but with the shell lobes entirely wanting, left neck lobe sometimes divided or insinuated in the middle; jaw smooth; genital organs without amatorial gland, or any other appendages; seminal receptacle and seminal duct very long.

The Trochomorphæ live on the ground generally in decaying vegetable matter, under or on old wood. Three species have been found on Penang.

Albers, while noticing several typical species, such as *T. planorbis*, Less., under his genus *Discus*, referred to *Trochomorpha* a most varied mixture of shells: for instance; anceps, Gould, serrula, Bens. etc. which belong to *Rotula*; Barrackpoorensis, Pfr., is a Kaliella; cacuminifera and infula, Bens. are Sitalæ (= Conulema, olim); H. capitium, Bens., does not belong to the present family, but to the next, the true Helicidæ, etc.

E. v. Martens (l. cit. pp. 246 and 247) adopted two groups in the genus Trochomorpha; the one, for which he proposes the name Nigritella, includes the obtusely conoid and more solid shells, sometimes with a somewhat obtuse periphery; these are true Trochomorpha, of the type of H. trochiformis, or of Troch. Ternatana, Guillou; the name Nigritella is, therefore, entirely superfluous. The second group is classed by Martens as Videna, Adams; it includes the more planorboid and sharply keeled species of the type of H. planorbis, Less. For this same group, (type H. castra, Benson,) W. T. Blanford proposed the subgeneric name Sivella.

Judging from the similarity of the shells of these two groups and from what we know of the animal of *T. Ternatana*, observed by Martens, I very much doubt that any necessity exists for subdividing the genus *Trochomorpha*.

TROCHOMORPHA CASTRA, (Benson). Pl. i, figs. 14-16 and pl. ii, figs. 7-9.

Helir castra, Bonson, Ann. and Mag. Nut. Hist., 1852, vol. x, p. 349.—Reove,
Corich. Icon., Helis, No. 1160.

The shell is subject to a very considerable amount of variation as regards the elevation of the spire. Young specimens are sometimes almost planor-bular, and in some adults the total height of the shell is scarcely more than one-third of the larger diameter, while in others it somewhat exceeds one half of the same dimension. The width of the umbilicus varies from 0.2 to 0.3 of the diameter of the shell. The base is always distinctly spirally striated, but on the upper side the oblique transverse striæ of growth prevail. The usual colour is pale horny, sometimes brown with a pale band below the suture.

The species is very rare on Penang hill, but it is common in Pegu, Arakan, Assam, Sikkim, and within the last few years it became abundant in the botanic garden near Calcutta, having been most likely introduced from Darjeeling. One of the largest Sikkim specimens in my collection measures: larger diam. 13, smaller diam. 12, height of shell 7, same of apert. 3, width of same 5.4 m.m.

The animal changes from dark leaden to blackish grey, being always paler at the sides of the foot, generally tinged with brownish below the pedal row; tentacles and pedicles mostly somewhat darker than the body; neck distinctly warty; sole dark grey, entire, without any distinct furrows; tail gland represented by a fine slit about one mill. long. The total length of the foot generally equals one and a half diameters of the shell, the caudal portion being always shorter than the anterior one. The mantle is blackish and in its extent above the large pulmonary cavity variegated with pale spots.

The jaw is smooth, very thin, almost semicircular, with broad oblique ends and a small, in younger specimens sometimes almost obsolete, projection in the centre of the concave edge; its width is about one half millimetre.

The radula is narrow, about two mill. long, or slightly longer, composed of about 85 transverse straight rows, there being about 101 teeth in each of them. All have very sharp, long and pointed cusps, the central with a small denticle on either side near the tip; on the outer ones, as they turn laterally and gradually decrease in size, the inner denticle disappears, while the outer increases, until on the last 15 or 20 teeth, preceding the 8 or 4 terminal ones, it equals the principal cusp. The last few teeth are short, broad, and their outer cusp becomes almost entirely obsolete, the teeth presenting merely an oblique sharp edge.

The female portion of the genital organs has a globular swelling near its origin at the hermaphrodite opening, and the receptaculum seminis branches off above this gland, it is fully one inch long, somewhat thickened in the middle. The penis is attached by a short muscle, about 4 m.m. long and moderately thickened.

TROCHOMORPHA CANTORIANA, (Benson). Pl. i, fig. 13.

Heliv Cantoriana, Benson, Ann. and Mag. Nat. Hist., 1861, vii, p. 85.

Five specimens which I found on Penang hill (at about 2000 feet elevation) exactly correspond with Benson's description, which was taken from a solitary specimen obtained by Dr. Cantor on the small island Sung-Sung near Penang. The illustration given on plate i will dispense with a repetition of the description quoted above. The apex is smooth, slightly swollen, and there are scarcely more than five whorls in specimens of 10 m.m.

The animal is blackish grey with a very narrow, pale dorsal stripe, quite similar to that of *T. castra*, but by some accident no specimen was preserved in spirit, so I cannot give any further details of its structure; it is, however, certainly a *Trochomorpha*. The specimens were found under a log of old wood.

TROCHOMORPHA TIMORENSIS, Martens. Pl. i, fig. 17, and pl. ii, figs. 10-12. E.v. Martens, in Preuss. Ost-Asiat. Exped., 1867, II, p. 248.

Penang specimens, of which I obtained sixteen, entirely agree in form and structure with the shell described by E. von Martens, with the single exception that the last whorl is not descending near the aperture, but there is an inclination to it, as its terminal portion in adult specimens is slightly more bent dewnwards than the preceding part (comp. figs. 17a and 17b). This character is, however, certainly a variable one; it does also occasionally occur in adult specimens of T. castra and T. planorbis. The differences noticed by E. v. Martens regarding the greater number of whorls, and the larger umbilicus, with less rapidly descending sides, in Timorensis, when compared with planorbis, are well marked in Penang examples.

The species is found sparingly on or under old wood all over Penang hill; *T. planorbis* was not met with there, but it is a very abundant shell at the Nicobars.

The animal is uniform blackish, mantle more intense black; pedal row distinct and the edge of the foot below it nearly quite smooth; neck and sides covered with small warts; tail gland represented by a very fine slit, scarcely more than half a millimetre long.

The jaw and radula are quite similar to those of *T. castra*. The former is about three quarters mill. broad, with somewhat curved out ends and a broadly rounded central projection in the concave edge. The teeth are very slender, and the lateral denticles are very close to the tip on the centre tooth. The outer denticle descends a little lower down on the laterals, but it

always appears to remain smaller than on the corresponding teeth of T. castra; the outermost laterals were not observed, they must be very thin.

The genital organs are distinguished by a very great length of the seminal receptacle and of the seminal duct; the former is one and a half to nearly two inches long; it is somewhat widened near its origin but further on almost throughout equally thin.

Fam. Vitrinides.

VITRINA NUCLEATA, n. sp. Pl. i, fig. 12 and pl. ii, figs. 4-6.

Vit. testa depresse ovata, tumidula, tenui, pallide cornea, translucente; anfractibus 3.75, nucleo 1.5 anf. composito, late conico, inflato, lævigato, duobus anf. sequentibus ad suturam adpressis, subcanaliculatis, rapide accrescentibus, nitidis, transversim-striis incrementi minutissimis notatis; apertura ampla, per-obliqua, labio undique tenuissimo, ad basin valde recodente, margine supero convexiusculo. Diam. maj. 9, diam. minor 7, alt. test. 5.3, alt. aperturæ 4.8, ejusdem latitudo 6.1 m.m.

A characteristically distinct species, by having the nucleus composed of one and a half whorls, conically tumid, while the next whorl is at its beginning only very narrowly exposed, or almost entirely covered. The outer lip is very thin, almost membranaceous, and simple throughout.

V. nucleata is one of the rarest Penang shells. I found three live specimens on the Penang hill in dense forest on old wood, about 1000 feet above the sea, and two more old shells at the base of the hill.

The animal is entirely black, only slightly paler at the front sides of the foot; it is very long and slender, its total length being about four times that of the longer diameter of the shell; the anterior part is the much shorter one, the posterior tapers into a point, and the whole is warty and grooved. The mantle, however, is nearly smooth. In quite fresh specimens the two shell lobes entirely cover the shell, but generally the left lobe covers a little more than one fourth of the last whorl extending from the margin of the mouth, while the right lobe also covers one-fourth of it beginning at the angle of the mouth, but at the same time also envelopes the whole spire. The neck lobes are also well developed, rounded, with simple edges, the left is much larger and longer than the right one. The sole of foot is pale brown, divided by two grooves in nearly three equal parts, of which the median is smooth and the lateral transversely sulcated. Pedal row well marked by a thin groove above and along the entire base of foot.

The jaw is semilunar, radiately finely striated, with a blunt projection in the centre of the concave edge; the outer or convex portion is smooth; it measures about 0.75 m.m. in breadth.

The radula is about two mill. long and half a mill. broad; there are 110 transverse, almost quite straight rows, but only 61 teeth in each of them.

All have very sharply pointed cusps, the central has two small lateral denticles on either side; on the outer ones these denticles almost entirely disappear.

The genital organs are distinguished by a great length of the uterus, at the end of which lies a large albuminous (ag.) and hermaphrodite gland (hg.). The seminal receptacle (rs.) is a long, pedunculated, spacious bag which includes a peculiarly twisted, horny organ, provided on the concave side with short crispate appendage. It is the same problematic organ which I described in Sesara infrendens, Gld., and Macrochlamys [Duryella] honesta, Gld., (Comp. J. A. S. B. XL, Pt. II, p. 242 and 250, pl. xvi, fig. 5 and 6, and pl. xvii, fig. 13). Whether this structure represents the amatorial organ and whether that which we call a seminal receptacle really possesses the function which we attribute to it, appears to be as yet an open question. In the present species I found the terminal end of the so-called seminal receptacle filled with a milky substance, which under a high power exhibited a quite irregular flaky appearance.

In other respects the present species does not offer any anatomical peculiarities. The osophagus is comparatively thin, long, cylindrical. The kidney, situated near the end of the rectum, is very large, of a broadly triangular shape; the liver enormously developed.

Some years passed the Vitrinæ had been classed as a subfamily of the Helicidæ; more recently they had been by various authors treated with the Zonitidæ, in the Oxygnathe group of Helicacea. I think the older classification is preferable, as entered by Binney and Bland in their Land and Freshwater shells of N. America. But I would prefer to give them, together with Helicolimax, Hyalina and their allies, a position intermediate between the two families. They combine indeed several of the characters of both. Although they do not possess a terminal mucous gland on the end of the foot (as all Zonitidæ do), they have a more or less distinct pedal row, and the sole appears to be often divided by longitudinal grooves. The jaw is entirely or partially finely transversely striated, not quite smooth, as usually in Zonitidæ, and not ribbed, as in true Helicidæ. However, the teeth, particularly the outermost laterals, have more the pointed character of the former than of the next family.

Fam. Helicids.

Trachia* Penangensis, n. sp. Pl. iii, figs. 1 and 18-20.

T. suborbiculata, alta, spira breviter elevata, obtusa, modice sed profunde umbilicata, tenui, fere cornea, cuticula luteo-fusca dense et breviter pilosa induta, unicolore; anfractibus 4.5, convexis, sutura profunde subcanaliculata junctis, ultimo ad peripheriam uniforme convexo, ad aperturam paulo descen-

Compare, Stoliczka in Journ. A. S. B, vol. xl, Pt. II, 1871, p. 228.

dente, ad marginem umbilici obtuse angulato; apertura semilunari, labio tenui, labro expanso atque reflexo, ad insertionem umbilicalem paululum dilatato, ad.basin indistincte subangulato, pallide violaceo tincto. Diam. maj. 16, diam. min. 14.5, lat. aperturæ cum perist. 8.8, ejusd. alt. 8.2 m. m.

As regards the thin, almost horny, fulvous, thickly and finely setose structure of the shell, this species is probably most closely allied to *T. erinacea*, Pfr., but it differs from it, as well as from two other very similar forms, *T. quieta*, Reeve, and *T. eustoma*, Pfr., by its conspicuously more elevated spire. Other species of similar type, like *T breviseta*, Pfr., from Siam, *T. Helferi*, Bens., from the Andamans, and four or five others described by Pfeiffer and E. v. Martens have nearly all a more depressed form and mostly sub-angular last whorl, although their spire is somewhat elevated.

The animal is dark chocolate brown, with a very narrow pale dorsal and caudal stripe, the body is laterally somewhat more blackish in front, and tinged brownish behind; the posterior end of the foot is the shorter one, as in *Trochomorpha*, although not to the same extent.

The jaw is quadrant shaped, with about six strong ribs,* and one or two less distinct ones on either side; it is 1.3 m.m. broad.

The radula is about 2.5 m.m. long., and 1. m.m. broad; there are 95 transverse rows, and 91 teeth in each of them, decreasing in size the more they approach the edges. The centre tooth is slightly smaller than the first laterals. All have a large basal plate, which is on the centre tooth slightly emarginate in the middle of the upper edge; this emargination increases in depth on the laterals, the inner branch remaining smaller, until on the last ones the upper edge becomes represented by two obtuse branches. The hook is on all teeth comparatively small, broad, with a moderately sharp point. On about the tenth tooth a small denticle appears to shew on the outer edge near the tip, becoming more distinct on the following teeth. After the eighteenth lateral, the teeth become somewhat more rapidly shorter, but increase in width until the last are wider than long, or high, and on these the basal plate has almost entirely become obsolete.

The genital organs are more than an inch long. The female portion has a long seminal receptacle, strongly thickened and muscular for some distance from its origin, then passing into a long thin tube and terminating with a moderately enlarged bubble, attached by very thin muscular fibres to the albuminous gland which is situated at the end of the uterus. The vas deferens takes its origin near the upper end of the uterus; it is attached by numerous thin threads at the hermaphrodite opening, and after a short distance enlarges into a muscular tube. At the beginning of this enlargement is a short pointed flagellum (f), and at the

[·] Evidently very much like that of Campylea.

other end, where the penis begins, is a retractor muscle. The penis itself has near its base a coccal appendage; its terminal portion, before it joins the hermaphrodite opening, is very thin.

A comparison of the genital organs with those of *Trachia delibrats*, represented in J. A. S. B., vol. XL, Pt. II, 1871, pl. xvi, fig. 1, will shew, that the only essential difference consists in the presence of the small coecal appendage on the penis in *T. Penangensis*. The jaw has fewer and less strong ribs, than that of the former species, but the teeth themselves are extremely similar.

Taking all these anatomical characters together with those of the shell, as noticed in my paper cited above, I think we can consider *Trachia* as a fairly established genus of the HELICIDE.

HELIX [FRUTICICOLA] SIMILARIS, Fér. Pl. ii, figs. 1-3.

Comp E. v. Martens in Preuss. Exped. nach Ost-Asien, vol. II, pp. 43 and 270, etc. Stoliczka in J. A. S. B. vol. XL, Pt. II, 1871, p. 224.

On Penang this species is mostly found in the coco-palm plantations up to a height of about 200 feet, never in the interior of large forests and at great_elevations. The shells are of the usual small size (larger diam. between 12 and 13 m.m.), with or without a brown peripherical band. The strike of growth are generally fine, but in some specimens they accumulate to strong ribs which give the shell a very peculiar costate appearance.

I also obtained the species from Malacca, near Singapore, Hongkong, Chusan, Maccao, Canton, &c, northwards it extends through Tenaserim into Burma, where it is associated with a great number of closely allied species, some of which may prove to be more varieties of it. I may mention H. bolus, H. scalpturrita, H. Zoroaster, &c.

In Bengal itself the species is not known, but in Central India it is represented by *H. propinqua*, and on the Andamans by *H. hemiopta*. Judging from the great number of closely allied species in the Indo-Malayan region, there is certainly the greatest probability that the original habitat of *H. similaris* falls within the Indo-Malayan Archipelago, and that it has been introduced into Mauritius, China and South America.

The animal is rather slender, all over strongly warty, brownish fleshy white, or pale brown, the pedal row is very slightly indicated by a fine groove; the pedicles and tentacles are greyish white, mantle dull milky white with a slight vermilion tinge. When the animal is quite fresh the total length of the foot is equal to from two and a half to three longer diameters of the shell.

The jaw is semilunar, about 1 m.m. broad, with three strong central ribs, followed by a somewhat broader one on either side, while the next is only indicated by a faint dark line.

The radula is when compared with the size of the animal large, about 2:3 m.m. long, and somewhat more than one m.m. broad; it is composed of about 90 transverse rows, with 67 teeth in each of them. The central is much smaller than the adjoining laterals, with a long arched cusp. The laterals somewhat rapidly decrease in size after the 14th; on the outermost the basal plate gradually disappears, while the breadth of the teeth exceeds their length.

The genital organs are more complicated than in *Trachia*. The female portion has at its origin a rather short, thick mascular cocal appendage, which most probably represents the amatorial gland; it is widened near its origin and at its rounded end. The seminal receptacle is a round bag, attached to a long thin peduncle of about the same length as the uterus. The seminal duct is moderately long, but the penis comparatively thick and attached by a strong muscle.

Fam. Bulimidæ.

Bulimus.—Subg. Amphidromus.

The only two species which I found among the coco-palms were Bulimus atricallosus, Gould, and B. interruptus, var. citrinus; the uniform coloured greenish yellow variety. The former is the more common species.

Besides these two, the ubiquitous Stenogyra gracilis is by no means rare at the roots of palm trees.

Fam. Clausiliida.

CLAUSILIA (PHÆDUSA) PENANGENSIS, n. sp. Pl. ii, figs. 4-6 and 15-17.

C. testa fusiformi, plus minusve atenuata, medio ad anfractum penultimum latissima, non rimata, solidula, castanea, apice submammillata, albescente, anfractibus 9-5 ad 10-5, convexis, sutura simplici junctis, transversim confertissime striolatis, penultimo sensim attenuato; apertura ovata, intus castanea, peristomate modice expanso, undique libero, albescente, plica supera crassa, ad marginem aperturæ continua, columellari immersa, tenui, valde oblique intrante; plicis palatalibus six, prima longissimima, unam mill. a margine suturali distante, ceteris multo brevioribus, subæqualibus, modice curvatis atque fere æquidistantibus.

Var. brevis, exquisite fusiformis, vide fig. 6 et 6a; long. 24, lat. 6.2, apert. cum perist. 6 longa, 4.5 m.m. lata.

Var. elongate fusiformis, vide fig. 5; long. 26:8, lat. 6:2, apert. 6:2 longa, 4:7 m.m. lata; in hoc specimine apertura exceptionaliter longa.est, in speciminibus alteris, forma similibus, longitudo apertura 6:2 ad 6:4 observanda.

Var. exilis, attenuate fusiformis, vide fig. 4 et 4a; long. 27, lat. 6, long. apert. 6:3, lat. 4:6 m.m.

Hab.—Penang hill, frequens.

This is an extremely variable species as regards the shorter or longer fusiform shape of the shell, and also as regards the size of the aperture, but both these variations are very commonly observed in other species of the genus, and particularly in the allied Malayan species Cl. Gouldiana, Pfr., insignis, Gould,* and Sumatrana, Martens.† All three have a similarly variable shape, and finely striated, moderately convex, whorls, but in the two former the aperture is much shorter of a squarish shape, and in the last it is conspicuously longer; E. v. Martens gives its length at 8 m. m. in a specimen, the total length of which is from 23.5 to 31.5 m. m. In this last species, which also comes nearest to the Penang shell, the whorls appear to be slightly less convex and there are only five palatal plates present.

The animal is uniform grey covered with small pale brown warts, darker on the back, paler on the pedicles, which have very small, black eyes; tentacles very short.

The general anatomical structure agrees with that which I published of Ol. Philippiana, (comp. J. A. S. B., vol. xl, pt. II, 1871, p. 174, pl. vi, fig. 8).

The genital organs are distinguished by a very great length of both the uterus and the penis, both of which are much twisted. The only appendage is that of the seminal receptable, which is comparatively small and narrow, situated at the end of a long peduncle.

The jaw is very short, about 0.5 m. m. broad, apparently smooth; only very faint radiating and concentric lines are to be observed in certain lights.

The radula is about 2 m.m. long and 0.5 m.m. broad; it consists of about 125 rows, with 61 teeth in each row. All are provided with a strongly curved cusp; after about the fifteenth tooth, they rather rapidly decrease in length. Towards the end of each row they become multi-serrated, while the basal plate almost entirely disappears. The last teeth are very short, but broad, almost linear and entire.

CLAUSILIA [PHÆDUSA] FILICOSTATA, n. sp. Pl. III, figs. 7-8.

Cl. testa fusiforme turrita, apice sensim attenuata, subrimata, tenui, pallide cornea; anfractibus 10 ad 11, lente convexiusculis, sutura simplici junctis, ad suturam filiforme marginatis atque infra marginem paulum contractis, transversim oblique dense costellatis, antepenultimo vix latiore quam penultimo, ultimo versus aperturam paululum contracto; apertura ovate subtrigona, postice, (aut supra), subangulata, peristomate expanso, undique libero, plica

[•] J. A. S. B., xli, pt. 11, pp. 203, 204, 208, pl. ix.

[†] Ost-Asiat. Exped, 1867, p. 379, pl. 22, fig. 17.

supera tenui, haud usque ad marginem peristomatis interni extensa, intus in fauce rapide evanescente, columellari approximata, fortiori, valde obliqua; plicis palatalibus circiter decem, supera longissima, a margine distante, duabus vel tribus sequentibus multo brevioribus, cæteris brevissimis, omnibus inter se irregulariter dispositis. Long. 21.2, lat. 4.4; long. apert. cum perist. paulo imperfecto 4.8, lat. 3.6 m.m.; specim. secundi apert. cum perist. perfecto 5.3 longa et 4 m.m. lata.

Hab.—Penang hill, cum precedente, sed rarissima.

This species is very closely allied to *Cl. Javana*, Pfr., but the latter has the whorls, particularly the middle ones, somewhat higher, the transverse costulation is a little finer, and more crowded, the palatal plaits are fewer, two according to Küster, three to four according to E. v. Martens; it also appears to have the two labial plaits stronger. I do not know any other species with which the Penang shell can be compared. It appears to be extremely rare; out of three specimens found only one has the aperture with the margins perfectly well developed.

Fam. Philomycidæ

Binney and Bland, Land and frosh-water shells N America, pt. I, 1869, p. 294.

Genus. PHILOMYCUS.

1820. Rafinesque. Comp. 'Complete writings,' by Binney and Tryon, 1864, p. 64.

1821. Férussac, Tabl. syst. des Limaces, p. 14.

1823. Meghimation, Husselt, Algem. Konst. &c., p. 232; idem, Fér., 1824.

1812 (August). Incillaria, Benson, Ann. and Mag. Nat. Hist. vol. ix, p. 486.

1842 (Septb.). Tebenophorus, Binney, Boston Journal, iv, p. 171, and 1844, Wyman, ibidem p. 410.

1866. Philomycus, (anatomy of) Keferstein, Zeitsch. Wissensch. Zool., vol. zvi, p. 183.

1866. Incillaria and Meghimatium (anatomy of), Keferstein, Malacoz. Blætter, vol. xiii, p 64.

1869. Tobenophorus, Binney and Bland, Land and Fresh water shells N. Am. pt. I. Pulm. G oph., p. 295.

Philomycus apud H. and A. Adams, Chenu, E. v. Martens &c.

It must be admitted that the original characteristic of the genus by Rafinesque is a very unsatisfactory one, but that is the case with many other old definitions. When Rafinesque wrote that *Philomycus* has no visible mantle, everybody* could, I think, fancy that the mantle must extend over

Binney writes in 1841 (Boston Journ. IV, p. 174) of his Philomyous dorsalis corporeclypeo nullo,' and on p. 171 of Tebenophorus carolinensis 'clypeo late et elongato, dorsum integrum vestiente,' and still both species have the mantle covering the entire upper surface of the body, and both are Philomyous (or Palliera of Morse).

the whole body, if the animal can at all be closely compared with Limax, or else it could not be a Mollusc at all. This was indeed well understood by Férussac, who in the next year referred to Philonycus, besides the four insufficiently described species of Rafinesque, Limax carolinensis of Bosc, well known from description and figure, (copied in Hist. nat. des Moll., pl., 6, fig. 3). And as Rafinesque's species had not been rediscovered and his descriptions not made more complete, Ph. carolinensis remained to be considered as the type of the genus, though I do not think that there can be much doubt on the point, that Férussac had correctly interpreted Rafinesque's meaning. In any case there was no sufficient ground for introducing the name Tebenophorus for the same species.

Keferstein (loc. cit.) has shewn by the anatomical examination of the three typical species, Philomycus carolinensis, (seu Tebenophorus). Meghinatium striatum and Incillaria bilineata, that all three genera have to be united into one. The general anatomy and dentition &c., agree in all, the only traceable distinction of Phil. carolinensis consists in the presence of a small amatorial organ, situated at the entrance of the seminal receptacle. The presence or absence of this organ, or even of that of a special amaterial gland (see ante, p. 13), is rightly considered by Keferstein as insufficient for a generic separation of the American from the Indian species. I had repeatedly opportunity of satisfying myself of this by the observation, that the development of that organ does not only appear .to depend upon the age of the animal, but often even upon the scason or peculiarities of the conditions, under which the animal lives. As far as our materials enable us to judge, we can, I think, look upon Philomycus as a well established genus. For the present it has to be regarded as the sole representative of the family. The finely radiately striated (in Ph. dorsalis coarsely ribbed) jaw in part resembles that of the VITRINIDE, but the dentition has decidedly more the character of true HELICIDE.

I have to notice one new species found on Penang.

PHILOMYCUS PICTUS, n. sp. Pl. III, figs. 9-14.

Ph. corpore tenuiter cylindraceo, plus minusve (35 ad 46 m.m.) extenso, antice rotundate subtruncato, postice acuminato, livido, copiose mucoso, suprâ pallio lævigato, lateraliter atque in parte postica nonnunquam subgranuloso tecto, fasciis tribus longitudinalibus atratis, reticulationibus ejusdem coloris junctis, picto, faciâ centrali latissimâ, duabus alteris tenuioribus ad latus dorsi sitis et a margine inferiore distantibus; orificio pulmonari antice ad latus dextrum in incisione pallii sito, circiter 5 ad 7 m.m. a terminatione antica distante; pedunculis oculiferis circ. 5 m.m. longis, tentaculis brevissimis, ambobus pallidissimis; pede infrâ transversim plicatello, livido.

During life the length and comparative thickness of the animal changes very rapidly, as may be noticed from a comparison of the two sketches taken from life and one from a specimen preserved in spirit. The animal is covered by a thick layer of mucous secretion, it is very active, and readily burrows in light decomposing vegetable substance. The three black longitudinal bands are connected by a similarly coloured net work which continues, interspersed with, or dissolved into, little dots, to the lower edge of the mantle. The three distinctly marked bands distinguish the present species from the Javaen Ph. reticulatus, according to Férussac's figures 2* and 3 on pl. 8 E., p. 96*, Moll. terr. et fluv. vol. ii. The peduncles are about 5 m.m. long, provided with distinctly developed globules on which the small black eyes are situated; the tentacles are very short, and when the animal moves about scarcely noticeable; both are very pale coloured.

The anatomy of the species almost perfectly agrees with that given by Keferstein of *Ph. striatus* and *bilineatus*. The internal pulmonary cavity extends to about one anterior fourth of the length of the body, and in the fresh animal is always well marked by the mantle above it being somewhat inflated. On this inflated portion, the mantle is smooth, on the other parts generally slightly rugose.

The genital organs (comp. fig. 13) have no special amatorial gland. The seminal receptacle is a globular pedunculated bag, situated a short distance from the hermaphrodite opening. In two specimens which I examined, I noticed the development of a strongly fibrous bundle of muscles at the entrance of the receptacle, where it branches off from the oviduct, but there was no special amatorial organ present.

The jaw is semilunar, strongly curved, thin, radiately striated; when laid flat about one mill. broad.

The radula is 2.8 m.m. long, only about 0.5 broad; there are about 170 rows, and 87 teeth in each row: the central tooth with a symmetrical simple curved cusp, the laterals with a more oblique but simple cusp, both it and the basal plate gradually decrease in height until the last teeth become almost linear and form a confluent row.

None of the other organs require any special notice.

I found three specimens of this species among old decaying vegetable matter on the ground at the northern base of Penang hill, about one hundred feet above the sea.

* E. v. Martens (Preuss, Exp. nach Ost-Asien, Landschnecken, p. 182) refers to this figure as a synonym of Hasselt's Parmacella reticulata, which he quotes as Parmaron reticulatus. I do not know Hasselt's original figure, but surely the one given by Férussac does not represent a Parmacella or a Parmarion.

Fam. Pupide.

This family is represented in India and Burma by Hypselostoma, Boysia and various subgenera of Pupa, all of small size. Among the Pupa found in Burma and the adjacent countries, inhabited by a large number of Malayan forms, the majority are referable to Albers' subgenus Scopelophila, the type of which is Pupa Kokeilii, Rossm. The shells are small, subconic or subcylindrical, composed of 4 to 8 whorls, with a moderately thin, semicorneous or corneous texture, covered by a brown cuticle; the last whorl is rimate at the base, always somewhat rapidly turned to the front, generally slightly ascending at the aperture, which is internally instructed with teeth on the whole peristome; commonly there is a bifid tooth on the inner lip, it is larger than any of the others. Some of the species appear to differ from Pupilla merely by the peculiar turn of the last whorl towards the front, thus shewing a strong affinity to Hypselostoma. The Indian species of Scopelophila, as far as I observed them, have the pedicles well developed and the tentacles short.

A second small group of *Pupa*, which is found in India, Burma and the country southward, is characterised by a subconic or ovate shape, composed of three to five whorls, of a thin corneous texture, covered with a transversely striated cuticle; the last whorl is not ascending, the aperture generally edentulous; the columellar lip is externally near its attachment somewhat expanded, mostly covering the umbilical region, while internally at the base it is twisted and occasionally provided with a small tooth. I propose for this subgeneric group the name

Pupisoma,

and regard as the type of it the Moulmein P. lignicola, described in J. A. S. B., vol. xl, pt. ii, p. 171, pl. vii, fig. 3. The animals have very short pedicles and barely a trace of tentacles. They generally live on wood.

PUPA [SCOPELOPHILA] PALMIRA, n. sp. Pl. II. fig. 3.

P. testa ovate cylindracea, rimata, sordide albida, cornea, apice obtusiuscula; anfractibus quinque, convexis, gradatim accrescentibus, sutura simplici
junctis, sublevigatis, fere politis, lineis nonnullis incrementi transversis obliquis, exilissimis notata; apertura fere verticali, subquadrangulari, intus
quinque-dentata, albida; labro undique expansiusculo atque paulum incrassato, extus infra suturam sinuoso, intus profunde bidentato, (dente supero
minori), ad basin dente unico minuto et ad medium collumellæ altero fortiori
instructo; labio tenui, adnato, extra medium prope angulum posteriorem
aperturæ dente lamelliforme bipartito munito.

Long. testæ 2.15, latit. 1., long. apert. 0.8, lat. 0.6 m.m.

Hab.—Penang et in Provincia Wellesley dicta, sub corticem Cocce nuciferæ; testa rarissima.

This is of exactly the same type as the Arrakanese P. filosa, described at p. 383 of the Journal for last year, but it is larger, more cylindrical and has one tooth more in the aperture. From P. Avanica it differs by less closely wound whorls and by the interal dentition of the aperture.

It appears to be a very rare species. I found one specimen under the bark of a cocoa-nut tree on Penang, and two others on the opposite coast in the Wellesley Province.

PUPA [PUPISOMA] ORCELLA, n. sp. Pl. II, fig. 2.

P. testa subglobose concidea, apice obtusa, angustissime perforata, tenui, cornea; anfractibus 3 5, valde convexis, sutura simplici junctis, transverse filose striolatis; apertura subrotundata, paululum obliqua, edentula; margine externo tenuissimo vix repandiusculo, columellari albescente, vix torto, supra reflexo, umbilicum fere omnino obtegente.

Alt. testæ 1.7, diam. 1.25, alt. aperturæ 0.6 m.m.

Hab .- Penang, sub corticem Cocos nucifera, haud frequens.

The animal is grey with dusky pedicles, but no perceptible trace of tentacles. The species differs from *P. lignicola* (l. cit.) by a shorter and broader form, more convex whorls, and by a very slightly expanded and thin outer lip. In fresh specimens some of the transverse strise of the cuticle are rather stronger than others, but they very soon wear off.

Fam. Streptaxide.

This family is represented by the single species *Ennea bicolor*, occurring with *Stenogyra gracilis*, though not very commonly. (Comp. J. A. S. B., 1871, vol. xl, pt. ii, p. 169).

Fam. Veronicellide and Vaginulide.

I have collected two species, which are by authors usually referred to the genus *Vaginulus*, and with which Blainville's *Veronicella* is considered as identical.

The one species is the same as Vaginulus Birmanicus, briefly described by Theobald in Journ. A. S. B., vol. xxxiii, for 1864. It is found about Calcutta, extending throughout Bengal up to the base of the Sikkim hills, through Arrakan, Tenasserim to Penang. A specimen obtained at Singapore does not appear to differ; E. v. Martens' V. Hasselti, (Preuss. Exp. Ost-Asien, Landschnecken, 1867, p. 176, pl. 5, figs. 2 and 4) from Sumatra, Borneo, &c., also appears to be the same, and it seems to me very probable that it is the true Onchidium molle of Hasselt.

A second species is very closely allied to *Vaginulus Tourannensis*, Eydoux and Souleyet, (Voyage de la Bonite, pl. 28, figs. 4 to 7), found by Mr. Gaudichaud at Touranne in Cochin Chins.

A close examination of various eastern species of what authors usually call *Vaginulus* or *Veronicella* appears to me to indicate, that a great confusion has been brought about into the definition of these terms. First of all, we have to return to the typical species of those two generic terms, leaving all subsequent researches regarding other species out of the question.

Blainville's description of his Veronicella lævis in 1817 was incorrect as regards the existence of a rudiment of a shell. The mistake was, at least partially, corrected by Blainville in Dict. d. Sc. Nat. vol. 57, p. 348,* and Keferstein, after discussing the opinions about this genus, in Zeitsch. Wiss. Zool., xv, 1864, defined† Veronicella as it ought, I think, to be accepted.

The animals have the sexes distinct in one individuum, the male organ under the right peduncle, the female about the middle of the lower right side of the mantle; tentacles bilobed; the anal and respiratory orifices are at the posterior end; the jaw and teeth of the radula resemble those of the Helicide. Thus the general anatomical structure of Veronicella agrees in some respects with Onchidium (comp. Stoliczka in J. A. S. B., xxxviii, pt. ii, 1869, p. 88, pl. xiv), but in this genus the female genital opening lies with the two others at, or close to, the posterior end; the teeth are peculiarly hook-shaped, and there is no jaw present. As one of the characteristic figures of a Veronicella I may mention Vag. Solea, d'Orb., (Voyage dans l' Ammerid., Moll. pl. 21) from Buenos Ayres, or Vag. Luzonicus, Eydoux and Souleyet, in Voyage de la Bonite, Zoologie, vol. II, p. 495, pl. 28, figs. 1—3. Thus our species will have provisionally to stand as

VERONICELLA BIRMANICA, (Theob.).

It is found all over the island; up to the top of Penang hill, but is not common, and the specimens are mostly small, about 1 or 1.5 inches. The median dorsal pale stripe generally becomes distinct only in older specimens, and the lower side of the mantle is uniform livid; in very young specimens the pale stripe is absent, and the mantle marked below with dark dots.

The name Vaginulus was introduced by Férussac in 1821. Judging from the description of the genus, in part at least, from the arrangement of the species and from the anatomical account given by Blainville, it is, I

In this article, Blainville strangely makes a great mistake in considering Vaginulus, Veronicella and Onchidium as identical.

[†] Comp. also Humbert in Mem. Soc. Ph. & Sc. Nat. Genève, vol. zvii, and E. v. Martens Preuss. Exped. p. 175, Vaginulus.

think, clear, that Férussac considered the first described species, V. Tunnaysi as the type of the genus, (Comp. Moll. terr. and fluv., II, pp. 96 p, 96q, . and explic. des pl. No. 13, pl. 8 c.). Férussac's characteristic of the genus places the pulmonary opening at a distance of two-fifths of the length of the body from the anterior end, and on the lower right side of the mantle; the female sexual opening is said to be on the same side, about the middle; the position of the anus is not mentioned. Blainville's account of the anatomy is not clear and partly contradictory to Férussac's statement. Some of the figures appear to leave no doubt that the position of the female sexual organ is the same as that indicated by Férussac, in others (fig. I and III,) its situation is too much backward. The anus appears to be situated according to figure I near the sexual opening, but again it is said to terminate with the anus at the posterior upper end of the foot. In the figures II and III (l. cit.), which give an in gight into the whole anatomy of the animal, the true termination of the intestines is nowhere given. All this is very unsatisfactory.

Eydoux and Souleyet in their figure of *Vaginulus Tourannensis* also record a small opening at the posterior lower right end of the mantle. I can scarcely believe that this is correct; it is probably only a fault of the artist who thought that an opening must exist there, because it is clearly seen in the other species on the same plate, *Vag. Luzonicus*, which is a *Veronicella*.

My reason for doubting the correctness of Eydoux and Souleyet's figure is the very careful examination of the Penang species, which, as already mentioned, is closely allied to *V. Tourannensis*, if not really identical with it.

The Penang species has the following generic characters, as compared with those of *Veronicella*.

The sexes are distinct, the male opening is under the right peduncle, the female sexual opening lies, together with the anus and the pulmonary orifice, at the lower right side of the mantle, about two-fifths of the length of the body distant from the front. The sexual opening is nearest to the edge of the foot, then comes the anal and then the respiratory one; they are only separated by thin laminæ from each other. There is no jaw present, the manducatory organ consisting of a simple muscular tube, much as in Streptaxis or Testacella; the radula is short, composed of simple pointed teeth which are absolutely identical with those of the two last mentioned genera. There is no opening whatsoever at the posterior end of the foot or mantle; the pointed end of the intestinal organs is only attached by a bundle of muscles to the terminal inner surface of the mantle.

On p. 96r of Férussac's Moll. ter, and fluv., Blainville says that the upper

border of the mouth is provided with a dental comb ('peigne dentaire'), and further on, that the buccal cavity is supplied on its inner upper surface with very small sharp points ('trés petites pointes acérées'). The latter statement evidently refers to sharp pointed teeth of the radula, but does the former mean to indicate the presence of a jaw, such as exists in *Veronicella?* This is a question of great importance; for if the presence of a jaw can be proved, it would certainly not support the generic identification of our Penang *Vaginulus* with *Vag. Taunaysij*.

There are also a few peculiarities in the other anatomical structure, but on the whole this latter well agrees with that given by Blainville of Vag. Taunaysii, with the exception of one or two organs which he evidently misinterpreted.

My doubts against a generic identity of V. Tuunaysii with Veronicella, as formerly defined, appear to me to be supported also by external differences in the shape of the body. In V. Tuunaysii, as well as in the Penang species and in V. Tourannensis, the body is slender and high, so to say nearly cylindrical, the globules on the tentacles are well developed, the appendages of the latter large, the posterior end of the foot is pointed and somewhat projecting beyond the termination of the mantle. In Veronicella, on the contrary, the body is more depressed and of a generally more ovate shape, the lower appendage on the tentacles is smaller than the tentacle itself, the end of the foot is more rounded and not, as a rule at least, projecting beyond the termination of the mantle.

E. v. Martens, when speaking of *V. Taunaysi* (Preuss. Exp. nach Ost-Asien, Landschnecken, p. 6), says that the slight lateral expansion of the mantle and the higher body distinguish it from all other species collected in India, and this opinion is, I think, strongly in favour of my presumed distinction between *Veronicella* and *Vaginulus*; for it also exactly applies to the Penang species.

Finally, I must draw the attention to the remarkable external similarity in the form of the body of *Vaginulus porulosus*, Fér. (Moll. ter. et fluv. II, p. 96', pl. 8 E, fig. 5) with that a of *Testacella*. The former species is recorded after a drawing communicated to Férussac by van Hasselt, and is no doubt from Java or one of the adjoining islands. I think it represents a true *Vaginulus*, and not a *Veronicella*.

I have placed the above discussion before my malacological friends, because I consider a satisfactory solution of the points in question of considerable importance. The information is not easily obtainable, as the necessary materials are very much scattered about. If my suppositions prove correct, the so called AGNATHA group, and especially the TESTAGELLIDE OF STREPTANDE, will appear before us in a quite different light, when compared with the other

groups. They will shew that certain characters remain constant under different physical conditions, while others change, and that the change takes place according to certain principles, affecting similar or the same organs. Extended observations of this kind must give us the key to a correct systematic arrangement.

Our special question cannot be solved, unless Blainville's and Férussac's somewhat contradictory accounts of the structure and anatomy of Vaginulus Taunaysii had been satisfactorily settled. I hope to have myself an early opportunity of examining one of these animals, and until such a time I will postpone the detailed description of the Penang species, (and of another new one from Sikkim), together with their anatomy, which requires a careful comparison with that of Vaginulus and Onchidium, of each of which I will have to describe several interesting new forms.

Explanation of plates.

Plate I.

- Figs. 1—3. Rhysota Cymatium, (Benson), p. 11; a young, an adolescent and an adult shell.
 - 4-7. Rotula bijuga, n. sp., p. 14; four full grown specimens, variable in the height of the spire.
 - 8. Situla carinifera, n. sp., p. 16; 8, natural size; 8a, 8b, 8c, enlarged views.
 - 9. Macrochlamys stephoules, n. sp., p. 17; three views in natural size.
 - ,, 10. Microcystis palmicola, n. sp., p. 18; 10, natural size; 10a, 10b, 10c, three views enlarged.
 - Helicarion permolle, n. sp., p. 18; 11, twice the natural size; 11a, 11b, 11c, 11d, views in natural size.
 - Vitrina nucleata, n. sp., p. 23; 12, front view in twice the natural size;
 12a, 12b, 12c, three views in natural size.
 - 13. Trochomorpha Cantoriana, (Benson), p. 22; three views in natural size.
 - 14—16. , castra, (Bonson), p. 21; 14, 14a, 14b, three views in natural size; 15, side view of a specimen from Calcutta; 16 and 16a, top and lower views of a Darilling specimen.
 - 17. Timorensis, Mart., p. 22; four views in natural size.

Plate II.

- Figs. 1-3. Fruticicola similaris, Fér., p. 26.
 - 4-6. Vitrina nucleata, Stol., p. 23; 4s, represents the side view of the problematic amatorial organ enclosed in the bursa seminalis.
 - 7-9. Trochomorpha castra, (Benson), p. 21.
 - 10-12. ,, Timorensis, Mart. ; p. 22.
 - 13-15. Rhysota cymatium, (Bens.); p. 11.
 - 16-18. Rotula bijuga, n. sp., p. 14.
 - 19-20. Macrochlamys stephoides, n. sp., p. 17.
 - 21-30. Helicarion permolle, n. sp., p. 18.

All the figures are enlarged; the measurements in natural size are given in the text referred to.

Plate III.

- Figs. 1. Trachia Penangensis, n. sp., p. 24; three views in natural size.
 - 2. Pupa [Pupisoma] orcella, n. sp., p. 33; 2, natural size, 2a, 2b, enlarged.
 - Pupa [Scopelophila] palmira, n. sp., p. 82; 3, natural size, and two views enlarged.
 - 5, 4—6. Clausilia [Phædusa] Penangensis, n. sp., p. 27; 4, 4a, attenuated var.; 5, elongately fusiform var.; 6, 6a, fusiform variety; all figures in natural size.
 - 7-8. Clausilia [Phædusa] filicostata, n. sp., p. 28; views of two different specimens in natural size,
 - 9-14. Philomicus pictus, n. sp., p. 30; 9, 9a, 9b, three views taken from a specimen in spirit; 10 and 11, two views of the same specimen in different states of expansion, taken from life; all these figures are in natural size, but the other figures, representing the genital organs, the jaw and teeth, are enlarged.
 - " 15-17. Clausilia Penangensis, vide p. 27.
 - , 18-20. Trachia Penangensis, vide p. 24.

Explanation of the letters used on pl. II and III.

ho = hermaphrodite opening.

ut = uterus.

al = albuminous gland.

vd = vas deferens.

ag = amatorial gland.

• p == penis.

m = retractile muscle.

rs = receptaculum seminis.

po = pulmonary opening.

an = inner, or posterior, angle of mouth.

pn = peripherical angle.

u = umbilicus.

rs = right shell-lobe.

m = ·,, neck lobe.

ls = left shell lobe.

In == left neck lobe.

The small letters below the teeth refer to the distance of each tooth from the respective central tooth in each sories.

ON NEPHROPSIS STEWARTI, A NEW GENUS AND SPECIES OF MACRUROUS CRUSTACEANS, DREDGED IN DEEP WATER OFF THE EASTERN COAST OF THE ANDAMAN ISLANDS,—by Jas. Wood-Mason.

(Read 7th August, 1872, received 16th January, 1873).
[With plate IV.]

In April of last year, I was deputed by the Trustees of the Indian Museum, with the sanction of the Government of India, to proceed to the Andaman Islands for the purpose of making a collection illustrative of the marine fauna of that part of the sea of Bengal in which those islands I reached Port Blair about the 6th of April, and immediately put myself in communication with the Chief Commissioner, who at once placed at my disposal a well-manned boat and a small steam-launch, with which I dredged for nearly two months with much success from low-water line down to near 50 fathoms. Towards the end of my stay, General Stewart knowing my intense desire to try my fortune in deeper water, placed at my disposal for one day the S. S " Undaunted" which had been recently armed and put into commission for service as a guard ship. The time allowed was short, but sufficiently long to enable me to bring away samples of the life supported by the sea-bed at, and beyond, the 100 fathoms' line, and to ascertain that the sea-bed was uniformly covered with a thick deposit of fine olive-coloured mud derived from the waste of the coral-reefs and of the sandstone and serpentine rocks of the islands.* .This mud was not very productive, yielding only a few annelids, but was crowded with dead shells of Pteropods and Dentalium and with fragments of a large Brachiopod.

It was in the last cast of the dredge that I had the good fortune to capture the interesting addition to the crustacean fauna of these seas, described in the following pages. It is closely allied to Nephrops Norvegicus of northern European seas, so closely allied, indeed, that were it not for the absence of the squamiform appendage of the antenna, I should be under the necessity of placing it in the same genus as a second species. The absence of this appendage, however, leaves me no choice but to establish a new genus for its reception.

* The following rough analysis by Mr. Tween, the chemist of the Geological Survey of India, will show the proportion of insoluble matter:

Soluble in H Cl mostly Ca O Co ₂ ,	42.8
Insoluble clay and sand,	57.2

The discovery in these warm seas of a very near, of the nearest ally in fact, of so characteristic a cold-water species, remarkable though it is, will not appear so surprising when I mention the fact that my crustacean lived and burrowed in the mud of the sea-bed at a depth of nearly 300 fathoms in a temperature not certainly exceeding 50° Fahr.

One of the chief points of interest attaching to this new form lies in the loss of its organs of vision by disuse, as in Calocaris MacAndreweæ, Bell, in Cambarus pellucidus—a member of the same family as that to which Nephropsis belongs—and in the other crustaceans and animals inhabiting the caves of Carniola and Kentucky. I not only agree with Mr. Darwin* in attributing the loss of the eyes to disuse, but I also regard the great length and delicacy of the antennæ, and the great development of the auditory organs as modifications effected by natural selection in compensation for blindness.†

NEPHROPSIS, gen. nov.

Diag. Antennal scale absent.

NEPROPSIS STEWARTI, Sp. nov. Pl. IV.

Body covered with fine rounded tubercles and with a short but dense pubescence. The carapace is sub-ovoid, armed on each side, just externally to the base of the rostrum, and behind the anterior margin, with an acute forwardly directed spine; a similar spine springs from each side of the anterior margin itself at about the level of the upper surface of the antennal peduncle; the basis of each of these two spines is confluent with a conspicuous convexity to be seen just behind it; immediately in front of each of these convexities lies a smooth, slightly excavated surface bounded in front by a curvilinear row of tubercles. The cervical suture, dividing the carapace into an anterior or cephalostegal, and into a posterior or omostegal portion, is broad and deeply impressed mesially and laterally, until it reaches the level

Origin of Species, 5th Edit., pp. 171-173.

[†] Since these remarks appeared in the abstract of my paper (Proc. Asiat. Soc. Ben. viii, 1872, p. 151) Dr. Hagen's Monograph of N. American Astacidæ has reached Calcutta, and from it I give the following extract, on account of its obvious applicability to the species here described, merely remarking that the perusal of it led me to note also the stoutness of the rostrum and the great development of the cephalostegal spines in Nephropsis as compared with the slenderness of the one and the minuteness of the others in Nephrops: "But it seems to be a somewhat well recognized law in nature (Rathke, Metamorph. Retrograd., p. 135) that if any part is atrophied, or stopped in development, the nearest parts slow an abnormal increase of development. This is apparently the case in O. pellucidus; the eyes are atrophied, and the rostrum, the fore border of the cephalothorax, the antennal lamina, the basal joint of the inner antennæ, and the ephtoma are altered or largely developed." Op. Cit. 34.

of the anterior margin of the epistoma when it bends boldly upwards and backwards upon itself passing into the well-defined semicircular depression that bounds the lateral convexities described above. The cardiac region is broader than long, very convex transversely and bounded on each side by a densely-tu-berculated elevation which running backwards, downwards, and forwards along the line of the granulated rim of the branchiostegite, and finally bending upwards almost opposite the origin of the second pair of abdominal appendages, passes again into the swollen anterior boundary of the omostegite; the ovoidal area thus limited off is more sparsely beset with tubercles and presents a marked depression on its anterior half.

The rostrum carries on each side a most acute spine directed upwards and forwards, and curved slightly inwards; and above presents two roughly granulated ridges coalescent towards the tip but divergent at the base; beyond the spines it is canaliculate on each side, above and below, and each lateral ridge is fringed with long hairs; below it is carinated and coarsely granulated at the base. A faint linear impression, continuous with the groove between the ridges on the rostrum, passes along the middle line of the carapace almost to its posterior border; situated in this line, and marking the anterior limit of the convex gastric region, lies an almost erect spiniform tubercle.

Antennæ and antennules.—The peduncles of these appendages lie as in Nephrops Norvegicus in the same horizontal line, and their inner margins are ciliate. The basal joint, or coxocerite, of the former is extremely short, and wants the apical spine in Nephrops, but the perforated conical process on its inferior surface is remarkably salient; the second is devoid both of the prominent spine into which, in Nephrops, its distal and external angle is produced, and of the squamiform appendage or scale seen in all the other recognized genera of Astacidæ,* and developed to such an extraordinary degree in Carideous Crustacea; one or two small folds or impressions between, or upon, the second and fourth joints being all that remains of the antennal scale, and of the rudimentary joint that in Nephrops corresponds to the moveable spine of Astacus.†

- * The antennal scale in Astacoides oscaped the notice of Guérin who founded his genus on its supposed absence.
- † There appears to be no doubt but that the antennal scale is the representative of the outer of the two appendages borne upon the protopodite at an early stage of embryonic life, and, if the movemble spine in Astacus and its undoubted homologue in the antennæ of Nephrops represent the inner of those appendages, then must the three distal joints of the peduncle with the flagellum be looked upon, as Dr. Fritz Müller looks upon them, as a new formation (Neubildung) and no longer as being in serial homology with the five distal joints of the other appendages, e. g., of an ambulatory leg, which represent the endopodite, the excepodite being completely abouted or represented at most, as Rolleston remarks, by the annular constriction on

The flagella of the antennæ are remarkably long and of excessive fineness at their extremities.

The basal joint of the antennules has its upper surface greatly inflated, owing to the remarkable development of the auditory organ to which, in most Podophthalmatous Crustacea at any rate,* this joint gives lodgment; and the almost globular appearance of the joint as seen from the side contrasts strongly with the flatness of its upper surface in Nephrops or Astacus. Of the two remaining joints of the antennulary peduncle, the first is short and cylindrical, being less than half the length of the last which in Nephrops is short and equal to that which precedes it. The peduncle terminates in the usual manner in a double flagellum, the outer branch of which is conspicuously stouter than its filamentous and cylindrical fellow, perceptibly compressed, and thickly fringed below with short hairs along its distal third.

The *epistoma* is much the same as in *Nephrops*, save that its posterior edge is straight and presents two small tubercles which give it the appearance of being slightly roundly-emarginate in the middle.

The external maxillipeds and the parts of the mouth in front of them are identical in structure with those of Nephrops.

The eyes are completely rudimentary, neither pigment nor corneal membrane being developed; the peduncles indeed are present, but even these are short, subcylindrical, mere aborted structures, concealed entirely from view by the stout base of the overhanging rostrum; in spirit they have become perfectly blanched like the rost of the appendages, but in life the delicate rose-pink coloration of the animal extended itself to their very tips. The peduncles are far less conspicuous from the side view than represented in the plate.

The first pair of abdominal appendages, those which bear the great chelæ, are unfortunately absent, the specimen having lost its claws a considerable period previous to its capture, as the presence of uncalcified reproduced rudiments of these appendages indicates; the other legs are smooth and slender; the second and third pairs are didactyle; of these the former has both its upper and lower margins, from the base of the carpopodite to the extremity of the claws, fringed with long hairs; the latter, much the slenderer as well as the longer of the two, has its propodite greatly elongated, and its claws only are ciliated. The fourth pair, the longest of all and ciliated only on the outer face of the dactylopodite, and the fifth, about as long as the second pair, are monodactyle.

the ischiopodite. For the facts relating to the transformation of the embryonic exopodite into the antennal scale of the Prawn pari passu with the budding out of the flagellum and the abortion of the endopodite, vide Fritz Müller's admirable essay on the development of the crustaces entitled "Für Darwin," p. 41, fig. 31,

^{*} The caudal ear of Mysis forms an exception to this.

The last abdominal somite is immoveably united to that which precedes it as in *Nephrops* and the common Lobster;* and the sternum is linear as in the *Astacidæ* generally.

Post-abdomen.—The post-abdomen is gradually attenuated to the extremity of the telson. The appendages of its first somite are as completely rudimentary as they are in the female of Nephrops Norvegicus; † those which follow are long and slender, their foliaceous branches being very narrow, produced to a sharp point, and fringed with excessively long cilia. All the terga are covered with minute rounded tubercles, and present at their anterior ends, just behind the tergal facets, a broad smooth transverse groove with its hinder margin convex backwards.

The pleuron of the first somite is precisely similar to that of Nephrops Norvegicus, but those of the remaining somites are even more acutely triangular than in that species, and have their margins denticulate and furnished with a fringe of long cilia. In all the somites, with the single exception of the first, the tergal and pleural regions are most sharply defined as such, the former not curving continuously with the latter but terminating abruptly at the level of the ventral chords in a line convex outwards; so that, if a somite were detached, deprived of its ventral chord and flattened out on the table with its dorsal surface uppermost, the imaginary continuation from pleuron to pleuron of the plane in which these pleura laid, would pass below that of the surface of the tergum.

The 'swimmeret' constituted as in all other Macrurous Crustacea by the highly modified and backwardly placed appendages of the last postabdominal somite and by the 'telson,' differs in no particular of more than specific value from that of Nephrops; the mesial element, or telson, is longer in proportion to its breadth, its greatest breadth, being a transverse line separating its anterior from its middle third, and not at the base as in Nephrops, is slightly more truncate posteriorly, and the oblique rounded elevations, that gradually narrow as they pass backwards into the spines at its postero-

- * On characters furnished by the claws alone Dana artificially divides the recognised genera of Astaculæ into two groups, typified respectively by Astacus and Nephrops; the first of these is further subdivided according to the number of the branchæ and the mobility or immobility of the last abdominal somite. But no mention is made of the fact that this is firmly fixed in Nephrops too. If Paranephrops, a genus including only freshwator forms, should turn out to have a mobile last abdominal somite, then we shall have this curious fact presented to us, vis., that all those members of the family Astaculæ which live in freshwater or are terrestrial (Bhegaus) have this somite moveably united by membrane only to that which precedes, while those of them that are marine have it fixedly united to the rest of the sternum.
- † The ventral plates of the 2nd, 3rd and 4th postabdominal somites in the males of Nephrops Norvegicus have an erect spine in the middle line, but the females exhibit no trace of such.

lateral angles, are stronger than in *Nephrops*. The outer plate of the lateral elements of the swimmeret is moveably articulated at its posterior third as in the rest of the *Astacida*, but the sutural line is curved and the posterior margin of the proximal and larger division exhibits hardly a trace of the overlapping denticulations seen in other *Astacida*.

The only specimen (a female) obtained was dredged in from 260 to 300 fathoms about 25 miles off Ross Island on the eastern coast of the Andamans. That the specimen was really brought up from this great depth is certain from the unmistakeable signs of crushing from contact with the lip of the dredge, from its position in the dredge bag and from its firmly adherent greenish coating which appears to indicate that like Calocaris Mac-Andreweæ it was a burrower.

In conclusion I have to thank Captain Beresford, the commander of the vessel, for his skilful management of the sounding-line and for the zeal displayed by him in carrying out my wishes during our too short cruise.

I have much pleasure in connecting with this extremely interesting species the name of Major General Donald M. Stewart, C. B., Chi f-Commissioner of the Andaman and Nicobar Islands, to whose ever ready help the success of my trip was so largely due.

Explanation of Plate IV.

- Fig. 1. Nephropsis Stewarti, 9, nat. size.
- Fig. 2. Upper view of carapace of the same.
- Fig. 3. Swimmeret of N. S'ewarti.
- Fig. 4. " Nephrops Norvegicus.
- Fig. 5. Inferior view of antennary region of N. Stewarti.
- Fig. 6. " " " " N. Norvegicus.
- Fig. 7. Sternal region of N. Stewarti.
- Fig. 8. " " N. Norvegicus.

ON NEW OR LITTLE KNOWN SPECIES OF PHASMIDE. PART I,—Genus Bacillus,—by James Wood-Mason of Queen's College, Oxford.

(Read 7th August, 1872; received February 9th, 1873).

[With plates V, VI and VII.]

The difficulties that have hitherto defied all attempts at anything like a philosophical and natural classification of this interesting and truly remarkable family of Orthopterous Insects, although in a great measure due to the extraordinary extent to which protective modification has involved all parts of the body throughout the group, must be in part, at any rate, ascribed to our ignorance in so many cases of the opposite sexes of the species; and the discovery that Acanthoderus lacertinus, Westw. is the female of Lonchodes luteoviridis of the same author, renders it extremely probable that these latter difficulties will be found to be further complicated by other cases of the same nature. As instances of the value of a knowledge of the opposite sexes in the limitation of genera, I need only adduce the fact that the capture of Acanthoderus bicoronatus, West., and Acanthoderus semiarmatus, Westw. in copulá with their respective males will necessitate the removal of those species, together with their allies, to the genus Lonchodes. Thus at the very outset of my researches, I am enabled, by the inestimable advantage of a residence in the great distributional area or metropolis of the family, to withdraw from a genus some of the most bizarre of its extremely heterogeneous contents. Since the publication in 1859 of Professor Westwood's classical Monograph of the family, a large number of new or imperfectly known species has been described or remarked upon by various authors,* but chiefly by

Giebel, Zeitschrift für d. gesammt. Naturwissensch xviii, p. 113.
 Stäl, Ofversigt af Kon. Vetensk. Akad. Forhand. xv, p 308.

Coquerel, Ann. Soc. Entom. Fr. 1861; p. 495, pl. 9, fig. 1; Bull. Soc. Ent. Fr. 1866, pp. xxiii-xxiv.

Westwood, Proc. Ent. Soc. Lond, 1864, p. 16; Ann. Soc. Ent. Fr. 4e Ser. t. iv, pl. 6.

Walsh, Proc. Ent. Soc. Phil., iii, p. 409.
Philippi, Stettin Ent. Zeit. 1865, p. 64.
Murray, Ann. and Mag. N. H. 3rd Ser. xviii, p. 265-268.
Kaup, Proc. Zool. Soc. Lond. 1866, pp. 577-578.
Soudder, Proc. Bost. Soc. Nat. Hist. xii, pp. 99 and 340.
Lucas, Ann. Soc. Ent. Fr. 4me Série, t. ix, Bulletin, p. xxv.
Gerstæcker, Archiv für Naturgesch. xxxv, p. 211.

Bates,* de Saussure† and Kaup‡ whom I mention by name on account of the extent and of the extreme value of their contributions. These numerous additions will be enumerated under the genera to which they belong.

GENUS 1 .- BACILLUS, LATR.

Eleven new species have been referred to this genus since the appearance of Professor Westwood's monograph; of these one, viz., B. patellifer, Bates, is nearly certainly identical with B.? Artemis, Westw., and two others, viz. B. gramineus and aspericollis, Bates, are most probably, as indeed the author of those species himself suspects, the opposite sexes of one species. The necessary deductions being made, eight remain, which, added together with those described below to the thi-ty-eight recognized by Westwood, bring up the total of known species of Bacillus to fifty-live.

BACILLUS FUSCOLINEATUS, n. sp. Pl. V. Fig. 7.

- & Extremely slender, filiform, cylindrical. Antennæ of the length of the metathorax, 17-jointed; first joint depressed but not expanded, carinate above, with sub-parallel margins, the inner one of which is raised; second joint nearly twice as long as broad, sub-depressed; the rest filiform. Head scarcely narrowed from the eyes; a brown streak passes from the eye along
- * Descriptions of Fifty-two New Species of Phasmidæ, with Remarks on the Family, Trans. Linn. Soc. Lond. Vol. xxv, pt. I, pp. 321-359, pl. xliv, xlv.

† Rev. et Mag. de Zool. 1859.

Ann. de la Soc. Ent. de Fr. iv, Sér.

Rev. et Mag. Zool. 1861.

Phasmidarum nov. species nonnullæ Rev. et Mag. de Zool, 1868. pp. 63-70.

Mélanges Orthoptérologiques, 2me Fasc. Mém. Soc. Phys. de Genève, xx, pt. 1, pp. 227-326, pl. 2, 3.

‡ Ucber die Eier der Phasmiden. Berlin Entomologische Zeitschrift, Vol. 15, 1870. Neue Phasmides

Bacillus (Ramulus) Humberti, $\mathfrak Z$ $\mathfrak P$, (= Lonchodes sp.) Saussuro, Ann. Soc. Ent. Fr. 1861, p. 469. Hab. Ceylou.

Bacillus (Baculum) ramosus, 2, Sauss. Revue de Zool. 1861, 128, et Mél. Orth. Fasc. II, p 114. Hab. Brazil. (?)

Bacillus carinulatus, Sanss. & Q, Rovue de Zool 1868, 63, 1. et Mél. Orth. 1869. Fasc. II, p. III, Pl. II, fig. 1. Q Hab. Ceylon.

Bacillus grammeus, Bates, & Trans Lin. Soc. Lond. 1865, pt. I, p. 326, pl. xliv, fig. 4. Hab. Natal.

Bacillus aspericollis, Bates, Q, l. c., p. 327. Hab. Natal.

Bacillus Guenzii, Bates, & l. c, p. 327, Pl. xliv, f. 14 a. Hab. Natal.

Bacillus patellifer, Bates, Q (? = Bacillus? Artemis, Westwood), l. c., p. 328. Hab. Darjiling!!!

Bacillus Scytale, Bates, Q, l.c., p. 328, pl. xliv, fig. 9. Hab. Ceylon.

Bacillus leprosus, Gerst, Q, Arch. für Naturgesch xxxv, p. 211. Hab. Zanzibar.

Bacillus Gerhardii, Kaup, &, Proc. Zool. Soc. Lond. 1866. Hab. New Zealand.

Bacillus Geisovii, & , Kaup, loc. cit.,

each side of the body as far as the commencement of the fourth abdominal segment where it becomes somewhat interrupted; the interval between this line and the margins of the dorsal arcs of the body is silvery white; below, the insect is of an uniform light yellowish green; above, between the brown lateral lines, darker green; the meso- and meta-notum are indistinctly carinate down the middle, and under a moderately powerful lens appear to be marked with delicate wavy transverse striæ; the striation becomes less distinct on the abdominal segments. The abdomen is slightly expanded at the junction of its 4th and 5th segments from which latter it sensibly decreases in width to the apex of the seventh, whence it widens to a trifling extent; seventh segment equal to about 1; times the 8th, exactly twice as long as the 9th which is obtusely rounded at the extremity and above presents a median and two lateral less distinct ridges; these latter curve inwards at their apical ends, enclosing a shield-shaped area. Posterior margin of the terminal ventral segment slightly emarginate.

Legs simple, of excessive tenuity; anterior very slightly longer than the posterior pair; intermediate shorter by the length of their own tibia than the former. Cerei long, obtuse, porrected beyond the apex of the abdomen, slightly forcipated and grooved at the sides.

Total length 22 lines; head $1\frac{1}{4}$, prothorax 1, mesothorax $4\frac{1}{4}$, metathorax $3\frac{1}{4}$, abdomen $9\frac{1}{4} + 2\frac{1}{4} = 1\frac{1}{4}$; antenna $3\frac{1}{4}$.

· Hab. Murree, Panjáb. One specimen collected by Dr. W. Waagen.

BACILLUS HISPIDULUS, n. sp. Pl. VII. Figs. 2-3.

¿ Filiform, slender, sordid, with a dark-green median dorsal streak, extending from the apex of the mesothorax to the extremity of the abdomen. Head sub-ovate, with the sides slightly convergent posteriorly, antennæ 16-jointed, joints very distinct; first joint depressed but not expanded; second twice as long as broad, cylindrical, its proximal end the broader. Mesothorax hardly narrower in front than behind. Meso- and meta-notum with a raised median line and a few minute tubercles on their lateral margins. Abdomen cylindrical and filiform to the apex of the 6th segment, whence it suddenly expands to the junction of the 7th and 8th, whence it narrows to its truncate extremity which appears to be constricted between the 8th and 9th segments; six basal segments slightly expanded at their articular ends; 9th segment strongly carinate; the cerci curved and projecting at its posterolateral angles.

Legs long, slender, and simple; first joint of anterior tarsi greatly elongated; rather more than twice as long as the remaining joints taken together.

Total length $24\frac{1}{2}$ lines, antennæ 4, head $1\frac{1}{4}$, proth. 1, mesoth. $5\frac{1}{4}$, metath. $4\frac{1}{4}$, abd. $10\frac{1}{4} + 2\frac{1}{4} = 12\frac{1}{2}$ lines.

A Much more robust, with a well-defined median raised dorsal line along the whole length of the body, antennæ absolutely shorter than those of the male, but with the basal joint strongly carinate and more expanded. The mesothorax is visibly attenuated in front from the commencement of its apical third, meso- and meta-notum with a few minute warts along their lateral margins; meso- and meta-sternum with a few similar warts scattered over their surface.

The abdomen is sub-fusiform, depressed to the apex of the 6th segment, and has a distinct ridge, which can also be detected on the thorax, running internally and parallel to the lateral margins of all its dorsal segments except the last; its five posterior segments have another ridge on each side midway between their sides and the median ridge. The posterior margin of the sixth ventral is produced in the middle into a sharp spine with a broad base. The seventh segment is nearly as long as the two last together; these are subequal. The last is subtruncate at its extremity beyond which projects a small triangular axygos plate carinated above. Cerci, in form of a tall four-sided pyramid with its angles rounded, project at the postero-lateral angles of last segment.

Operculm spatulate in outline and flat below, with a broadly rounded extremity, not extending beyond the middle of the last segment.

First joint of tarsus in anterior legs as in the male. The body is covered with very short setse in both sexes.

Total length, 31 lines, ant. $3\frac{1}{4}$, head $2\frac{1}{4}$, proth. $1\frac{1}{4}$, mesoth. $7\frac{1}{4}$, metath. $5\frac{1}{4}$, abd. $15\frac{1}{4} + 2\frac{1}{4} = 17\frac{1}{4}$ lines.

Hab.—South Andaman. Three males and three females, of which two were taken in copulá.

I have received from Dr. Stoliczka, who obtained it from the Arakan coast, an insect differing from the male insect above described only in its greater length, in the absence of tubercles on the thorax, and in having two more joints to the antennæ; the measurements are as follows:

Total length 32 lines: ant. 6, head $1\frac{1}{4}$, proth. $1\frac{1}{4}$, mesoth. $7\frac{1}{4}$, metath. 6, abd. $13 + 2\frac{1}{4} = 152$ lines.

BACILLUS OXYTENES, n. sp. Pl. V. Fig. 3.

Q Excessively long and slender. Head unarmed, narrow, almost cylindrical, being but slightly broader in front than posteriorly, notched behind in middle. Antennæ 28-jointed, as long as the terminal segment of the abdomen; first joint depressed, carinated above and expanded, second longer than broad, also depressed. Mesothorax much longer than the metathorax, sparsely granulated above and below, slightly expanded at the insertion of the legs, otherwise of perfectly uniform width; meta-thorax with only a few scattered granules above and below; meso- and meta-notum with a dark raised mesial line. Abdomen long, perfectly smooth, very gradually and

regularly attenuated from its base to its almost indescribably acute, deeplycleft, slightly recurved, and strongly compressed extremity. The seventh segment is hardly twice as long as the 8th, which is about a fifth of the length of the last; this has a perceptible upward curvature and is cleft nearly to the insertion of the minute conical cerci. The operculum is subdepressed, acutely pointed at the extremity, carinated below and reaches the commencement of the middle third of the last segment, where the cerci are inserted.

Legs long, but rather stout as compared with the body, triquetrous; the fore femora are serrated for more than two-thirds of the length of the straight portion, intermediate femora with two or three triangular spines close together above near the base; posterior ones with one or two. Tibis with a well defined but not very salient foliaceous carina below; four posterior ones with minute spinules on all their crests. The right middle leg is a reproduced limb, having but four joints to the tarsus and a single spine on the femur.

Total length of the body 4 in. 9 lines; antennæ $6\frac{1}{4}$: head $2\frac{1}{3}$; proth. 2; mesoth. $11\frac{1}{4}$; metath. $8\frac{1}{4}$; abdomen $23\frac{1}{3} + 10 = 33\frac{1}{3}$ lines.

Abdomen: rest of body:: 1.4255 &c.: 1.

Hab.—Pegu Yomah, collected by Mr. S. Kurz, the botanist at the Calcutta Botanic Garden, during his recent botanical tour through Burma and the Tenasserim Provinces.

In the form of the terminal segments of the body, this species approaches B. Regulus, Westw. 2 (Cat. p. 8, Pl. XXII).

BACILLUS LEVIGATUS, Pl. V. Fig. 4.

Q Very slender and cylindrical and smooth. The head is armed with two minute blunt erect spines between the eyes, and is slightly narrowed behind; its posterior margin with 3 or 4 notches. Autennæ exactly half the length of the mesothorax; first joint depressed and somewhat expanded, feebly carinate above, its outer margin more convex than the inner; second joint fully as broad as long, depressed.

Abdomen extremely long and slender, tapering very gradually to the apex of the seventh segment; whence it very slightly expands to the basal half of the last which suddenly narrows to its extremity; this is divided by a short cleft into rounded tips. 7th dorsal segment equal to 8th, half as long as the last which is carinate above. Cerci pointed. Operculum narrow depressed, obtusely pointed, reaching the end of basal third of last segment.

Legs simple; anterior pair tolerably long; anterior femora serrated for three-fourth of the length of upper crest. The first joint of anterior tarsi is twice the length of its homologue in the intermediate legs, which is rather shorter than that of the posterior legs.

Total length of body 2 in. 10 lin, ant. $3\frac{1}{4}$, head $1\frac{3}{4}$, proth. $1\frac{1}{4}$, mesoth. $6\frac{1}{8}$, metath. 5, abd. $15\frac{3}{4} + 3\frac{3}{4} = 19\frac{1}{4}$ lines.

Hab.—Samagooting, Naga Hills, Assam. One immature specimen collected by Capt in Butler. This species is closely allied to B. Westwoodii.

BACILLUS WESTWOODII, n. sp. Pl. VI. Fig. 3.

2 Elongate, slender, sub-cylindrical, convex. Head narrowed from the eyes to the base, with its sides slightly convex, armed between the eyes with two forwardly and slightly outwardly directed spines; and with its posterior margin faintly notched in the middle and on each side. Antennæ more than half as long as the mesothorax, from 21 to 26-jointed; first joint carinated above and depressed but not expanded; second joint nearly as broad as long; the rest filiform with the exception of the last which is thickened at the tip. Mesothorax slightly narrowed in front and, with the metathorax, somewhat expanded at the insertion of the legs. The abdomen is narrowed from the base to the apex of the first segment, expands again to the apex of the second, maintains pretty much an uniform width for the next two or three segments and finally gradually tapers to a point. The seventh dorsal segment is twice the length of the eighth, but hardly exceeds the last. 'This is cleft and slightly compressed at the extremity. The operculum is somewhat boat-shaped, below strongly carinate for its posterior half, and comes into such close and complete opposition with the margins of the terminal dorsal segments, with which it is coincident, as to conceal from view the genital parts, permitting only the tips of the cerci to emerge. Legs triquetrous, their edges beset with short cilia; straight portion of upper edge of fore femora serrated nearly to the apical end; the intermediate and hind femora have a triangular spine below at the apex; all the tibiæ have a foliaceous carina arising near the base and gradually subsiding towards the apex; the posterior ones have sometimes a triangular foliaceous spine near the base above; the intermediate ones sometimes one, two or none. Tarsi triquetrous; first joint of the anterior pair as long as the others taken together; in the other legs it is not nearly as long as the united lengths of the remaining joints.

Total length of the body 4 in. 8 lines, antennæ $6\frac{1}{4}$, head $2\frac{1}{3}$, proth. 2, mesoth. 11, metath. 8, abdomen $27\frac{1}{3} + 5\frac{1}{2} = 33$.

Abdomen: rest of body:: 1.4042: 1.

In the specimen described, the intermediate legs when stretched straight backwards, reach to the commencement of the posterior third of the fourth abdominal segment, the posterior legs to the *cerci analès*; in other specimens the intermediate legs extend rather beyond the fourth segment, and the posterior ones beyond the extremity of the abdomen.

Hab.—Nine adult and three immature females were captured by my

private collector during the months of August, September and October last in the neighbourhood of Port Blair on South Andaman. An immature insect collected by Mr. Homfray at Camorta, Nicobar Islands, differs so slightly from larvæ, beyond doubt belonging to the present species, that I hesitate to give it another name.

BACILLUS (BACULUM) ARTEMIS, Westwood. Pl. VI. Figs. 1-2.

Bacillus? Artemis, 2, Wostwood, Cat. of Orthopterous Insects in the British Mus., 1859, Pt. I, Phasmidæ, p. 10, pl. xxvi, fig. 9, 9a.

B. patellifer, Bates, Q, Trans. Lin. Soc. London, 1865, Vol. xxv, Pt. I, p. 328.

Numerous specimens of an insect remarkably abundant in the moist, deep valleys of Sikkim, in Cachar, in the Bhutan Doars and at Samagooting in the Naga Hills, agree in every respect both with Bates' description of B. patellifer and with Bacillus? Artemis described and figured by Prof. Westwood from a dried and mutilated example now in the Hopeian collection at Oxford. The comparison of dried specimens in my possession with Westwood's figures shows that the compression of the three terminal segments is mainly, and that the depression and enlargement posteriorly of the sixth dorsal are entirely effects of drying. Bates omits to mention that the terminal dorsal segment is grooved above in the middle line, and that the emargination in its posterior border is occupied by a small carinated azygos plate with a rounded hinder margin; the state of preservation of Prof. Westwood's specimen may probably account for his omission to mention not only these points but even the emargination itself. The following are the dimensions of a specimen from the Naga Hills figured on plate vi.

Total length 4 in. 5 lines, ant. 7 lines (25-jointed), head $2\frac{1}{2}$, proth. 2, mesoth. $10\frac{1}{2}$, metath. 8, abd. 2 in. $0\frac{1}{2}$ line +6=2 in. $6\frac{1}{2}$.

A variety found in all the districts mentioned above with the exception of the Bhután Doars is figured side by side with the typical form on the same plate as showing the value of the armature of the legs unsupported by other characters in making a species; almost every gradation from the extremely acanthophyllous and spinose condition of the legs there depicted to their almost completely unarmed condition in fig. 1 being to be met with. Fig. 2 a, 2 b, 2 c may represent the same parts of fig. 1.

BACILLUS (BACULUM) INSIGNIS, n. sp. Pl. V. Figs. 1-2.

Extremely robust, greatly elongated, subcylindrical, convex. Head remarkably stout, conspicuously narrowed from the eyes to the base, the sides being almost straight, armed between the eyes with two stout-based, acuminate, forwardly-directed and incurved spines or horns, notched posteriorly in the middle. Antennæ 25-jointed; basal joint depressed, expanded, and carinated above. Mesothorax gradually attenuated from the

base forwards; metathorax of uniform width; both are marked above with a fine raised median line which is continued on to three or four of the basal segments of the abdomen.

The abdomen is attenuated from the base of its third segment to the extremity. The three terminal segments are compressed; the first of these is twice as long as the second; the second $1\frac{1}{3}$ times as long as the last which is grooved above in the middle line and has its posterior margin divided into two rounded lobes by a narrow fissure filled by the median carina of a small azygos plate; the upper contour of this last segment meets that of the preceding at a very obtuse angle. The operculum extends about one line beyond the abdomen; its posterior half is greatly compressed, so much so at its sub-truncate extremity that its opposite inner faces are in complete contact. Cerci minute, conical, their tips alone projecting slightly between the posterior and middle thirds of the last abdominal segment.

Legs stout, triquetrous; upper and lower crests of fore femora inconspicuously serrate towards the base; the intermediate femora are curved, their upper margin forming the convex curvature, and below at the base present two conspicuous divergent foliaceous expansions with rounded free margins, one springing from each crest and a conical spine at the apex; the posterior femora are but feebly curved and exhibit but a faint indication of these foliaceous lobes, and have also a spine at the apex below; all four posterior femora appear to be regularly tricarinate above, owing to the very close approximation of their two upper crests. The intermediate tibiæ have a large foliaceous lobe like a tooth of a saw near the base above, which is much reduced or even absent in the posterior pair; all the tibiæ have a sharp, well-developed foliaceous carina, on their basal third below, which in the fore tibiæ traverses the whole length of the joint. The first tarsal joint in the fore-legs is hardly as long as the other joints taken together; in the other legs it is not nearly as long.

The intermediate legs if stretched backwards would reach only just beyond the apex of the third, the posterior ones to the apex of the sixth abdominal segment.

Total length of body 7 in. $2\frac{1}{2}$ lines; antennæ $8\frac{1}{2}$; head $3\frac{1}{4}$; proth. $2\frac{1}{2}$; mesoth. $16\frac{1}{2}$; metath. 14; abd. $40 + 9\frac{1}{2} + \text{operc. } 1 = 50\frac{1}{2}$.

Abdomen: rest of body:: 1.3655 &c.: 1.

Hab.—Samagooting, Naga hills, Assam, (Captain Butler); Sikkim (Mr. Mandelli); and the valleys around Cherra Punji in the Khasi hills (Lieut. Bourne).

BACILLUS (BACULUM) PENTHESILEA, n. sp. Pl. V. Fig. 5.

2 Elongate, stout, cylindrical, smooth, with a faint raised median line extending from the anterior extremity of the mesothorax nearly to tip of

the abdomen. Head not so stout as in the preceding species, armed between the eyes with two minute conical spinules or tubercles, its posterior margin presents 3 notches giving it the appearance of being bi-tuberculate, narrowed from the eyes to the base. Antennæ very slender, as long as the three terminal abdominal segments taken together, 30-jointed; first joint somewhat expanded; second minute, hardly longer than broad, followed by 28 filiform joints gradually increasing in length to the apical one. Mesothorax uniform in width except at the insertion of the legs where it is expanded. Metathorax broader than the mesothorax and expanded at each end.

Abdomen very long, attenuated from the base of the 5th segment; the three segments anterior to this are uniform in width and broadest of all, broader even than the basal segment which is just perceptibly concave at the sides; the 6th ventral has a rounded punctate callosity posteriorly; the ante-penultimate segment is as long as the two last taken together; the last is grooved above in the middle line, has its posterior angles pointed and rather deflexed than projecting outwards and its hinder margin subangularly emarginate, the emargination being filled by an azygos plate which is carinate, has its free margin straight and projecting beyond the acutely angular tips of the segment, and its postero-lateral angles rounded. Cerci tolerably salient, obtuse. Operculum subcompressed and carinate for nearly its posterior half, rounded but not compressed at the tip which barely reaches as far as the bottom of the emargination in the last segment.

Legs slender; anterior pair triquetrous; the two other pairs subtriquetrous, their upper crests being not nearly so closely approximated as in the preceding species. The intermediate legs, stretched straight backwards so as to be parallel with the long axis of the body, reach to the middle of the 4th, the posterior ones to that of the 7th segment. The anterior femora are denticulate to beyond the middle of their upper and lower crests; the four posterior pairs are devoid of spines or foliaceous lobes except at their apical ends below where there is a short denticulate elevation, all the tibiæ have a lamellar carina arising and attaining its greatest development near the proximal end; and the distal halves of the four posterior ones are acutely spinulose on all edges. The first joint of the tarsus of the fore-legs is fully as long as, of the intermediate legs shorter than, of the posterior legs almost as long as, the remaining joints together; but the first tarsal joint of 1st legs is longer and slenderer than those of the 2nd and 3rd pairs.

Colour green with the prosternum, bases of all the legs, the stigmata, the spines on the head and the interval between them, and the apex of the abdomen blackish-brown.

Total length, 6 in. 10\frac{2}{2} lines; antennæ, 9 lin.; head, 3\frac{1}{2}; proth. 2\frac{1}{2}; mesoth. 15\frac{1}{2}; metath. 18\frac{1}{2}; abdomen 8 in. 8 lin. + 9 lin. = 4 in.; ant. legs: femur 28 lin. + tibia 22 + tarsus 6\frac{1}{2} = 4 in. 8\frac{1}{2} lin.; inter. legs: f. 17\frac{1}{2} + \frac{1}{2} lib.

16 + t. $4\frac{1}{4} = 3$ in. $2\frac{1}{2}$ lin.; post. legs: f. 20 + tib. 18 + tar. 5 = 3 in. 7 lines. Abdomen: rest of the body: 1.3012 &c.: 1.

Hab.—A single specimen was collected in the neighbourhood of Baxa, Bhután Doár, by Dr. Cameron.

BACILLUS (BACULUM) FURCILLATUS, n. sp. Pl. V. Fig. 6.

\$\footnote{\pi}\$ Elongate, cylindrical, smooth. Head unarmed, narrowed from the eyes to the base, with three notches on its posterior margin. Antennæ long and fine, as long as the metanotum proper, or as the two basal segments of the abdomen together, \$2\forall -\jointed\$; first joint depressed, not greatly expanded, strongly carinate above; second longer than broad, sub-cylindrical; rest filiform. Meso- and meta-notum with a most delicate median line in relief; the former is of uniform width throughout, the latter very slightly expanded posteriorly at the origin of the legs. Abdomen shorter in proportion to the rest of the body than in the two preceding species, cylindrical to the apex of its fifth segment; whence it becomes slightly compressed and attenuated to its furcate extremity. A small azygos plate carinated above and with its posterior margin rounded, fills the bottom of the interval between the arms of the fork, which conceal its sides from view from above. The operculum is boat-shaped; its extremity which is rounded and slightly spread out horizontally, attains the level of the bottom of the fork only.

The legs closely resemble those of B. Penthesilea, but the four posterior femora have some widely-placed spinules on both their inferior crests; the intermediate ones reach to the end of the basal third of the 5th, the posterior extend slight beyond the terminal abdominal segment.

Total length 5 in. $1\frac{1}{2}$ lin.: antennæ 8; head 3; proth. $2\frac{1}{2}$; mesoth. $12\frac{1}{2}$; metath. 10; abd. $27\frac{1}{2} + 6\frac{1}{4} = 33\frac{3}{4}$; ant. legs, 3 in. 7 lin.; inter. legs, 2 in. 6 lin.; post. legs 2 in. 11 lin. Colour uniform green.

The abdomen: rest of body:: 1.2162 &c.: 1.

Hab.—Baxa, Bhután Doár, collected by Dr. Cameron.

This species is at once distinguished from the two preceding, as indeed these are from one another, by the difference in the structure of the terminal dorsal segment; by the form of the operculum, by the relative length of the abdomen to that of the body, and by the absence of spines from the head.

In the four preceding species to which M. de Saussure's subgeneric term *Baculum* may be provisionally applied, the last dorsal segment of the abdomen is mesially grooved above; the line of structural weakness thus produced, may possibly subserve the purpose of giving greater expansibility to the segment during copulation and oviposition. This peculiarity of structure is present also in *Bacillus* (*Baculum*) Cusiculus, Westwood, in *B.* (*B.*) Hyphereon, Westwood, and in *B.* (*B.*)

scytale, Bates, if one may judge from the published figures of those species. With regard to the last mentioned, it should be noted that Mr. Bates, although he states its affinities to be with the first, at the same time refers it to a totally distinct subgeneric group, viz., to Ramulus, de Sauss., in which the abdomen is fusiform and acuminate at the extremity. It is also to be remarked that the species to which B. scytale is said to be so nearly related by Bates has turned out not to be a Bacillus at all, but a Lonchodes very closely allied indeed to L. pseudoporus, Westw., if not identical with that species. Ramulus is, however, still retained by M. de Saussure for a group of the Bacilli, under which B. humilis, Westw., B. carinulatus, Sauss., &c., have been arranged.

BACILLUS SCABRIUSCULUS, n. sp. Pl. VII. Fig. 1.

The integument is wrinkled and studded with granulations and small tubercles. Head thick, coarsely granulated, very little narrowed behind, armed between the eyes with two conical spines, projecting outwards and slightly backwards and with their bases united by a transverse elevation, bi-tuberculate posteriorly. Antennæ as long as the metathorax, 18-jointed, ciliated; the first is depressed and expanded, and strongly carinated; the second joint is about half the length of the first, twice as long as broad and depressed; the rest are slenderer than it and filiform. Prothorax narrower in front, with its anterior margin hollowed for the reception of the head, covered with coarse granules. Meso- and meta-notum irregularly wrinkled longitudinally and covered with small tubercles or coarse granules, marked with a raised median line; the former gradually widens from the apex to the insertion of the intermediate legs; the latter is broader and of uniform width, and a distinct suture divides it into an anterior posterior division (the true 1st abdominal segment = segment mediare). Below, the ganulations and wrinkles are finer. The abdomen is cylindrical to the fifth or sixth segment, whence it becomes suddenly contracted and compressed, but expands again slightly at the apex which is furcate: the bottom of the fork is occupied by a small carinated azygos plate. The upper contour of the three terminal dorsal segments is extremely convex and the posterior margin of the first two of them is produced into a small process. The operculum is lanccolate in outline as seen from below, its posterior half is carinate and its apex barely reaches the level of the minute cerci.

Legs long; anterior pair triquetrous, the rest prismatic; anterior femora serrated to the middle of the upper crest; the intermediate ones are armed with three conspicuous dentate foliaceous lobes above and with three small spines on the other crest, one opposite to each of the foliaceous lobes; the posterior femora have some small spines on each of their upper crests. The

intermediate tibiæ have each two small foliaceous lobes above at the proximal end and immediately opposite to these, below, a single spine; at their distal ends all their edges are spinulose; the posterior tibiæ have two minute spines above at the proximal end and their distal ends are similarly spinulose. All the legs are shortly-ciliate, especially at the extremities.

Total length 4 in. $1\frac{1}{2}$ lines; antennæ $7\frac{1}{4}$; head $3\frac{1}{4}$; proth. $2\frac{1}{4}$, mesoth. $10\frac{3}{4}$; metath. $7\frac{1}{4}$; abdomen $18\frac{1}{2} + 7 = 25\frac{1}{2}$ lines.

Hab.—Naga Hills, Assam. A single specimen was collected by Captain Butler.

Explanation of Plates.

Plate V.

- Fig. 1. Bacillus (Buculum) insignis, Q, nat. size. 1a, the head seen sideways; 1b, the extremity of the abdomen seen sideways.
 - Fig. 2. Upper view of terminal abdominal segment of B. insignis, Q, enlarged.
 - Fig. 3. B. oxytenes, 2, nat. size; 2a, extremity of the abdomen from the side.
- Fig. 4. Bacillus lævigatus, Q, nat. sizo; 4a, b, c, represent same parts as in the previous figures.
- Fig. 5. Upper view of terminal abdomen segment of B. Penthesilea Q, enlarged; 5a, side-view of three terminal segments, nat size.
- Fig. 6. B. furcillatus, 2, terminal segment of the abdomon from above, enlarged; 6a, the three terminal segments nat, size seen sideways.
- Fig. 7. B. fuscolineatus, 3, nat. size; 7a, the three terminal segments of the body seen from above; 7b, the same seen from the side.

Plate VI.

- Fig. 1. Bacillus Artemis, Westw. Q, nat, size.
- Fig. 2. Bacillus Artemis, Westwood Q, var. nat. size; 2a, the three terminal segments seen from the side; 2b, the terminal segment, \times 2 from above, 2c, the extensity of the abdomen from below, 2d, basal joint of antennæ magnified.
- Fig. 3. B. Westwoodii; Q, nat. size; 3a, side view of three terminal segments of abdomen; 3b, the same from below.

Plate VII.

- Fig. 1. Bacillus scabriusculus, 2; nat. size; la, the three terminal segments of the abdomen from the side.
- Fig. 2. Bacillus hispidulus, 3, nat. size; 2a, the terminal segments of the abdomen seen sideways; 2b, the same seen from above; 2c, the same from beneath.
 - Fig. 3. Bacillus hispidulus, 2, nat. size; 3a, 3b, 3c, represent same parts as in fig. 2.

1878.]

On an undescribed species of Lophophanes, by W. E. Brooks, C. E., Assensole.

[Received 11th February, 1873; read 5th March, 1873.]
LOPHOPHANES HUMEI, n. sp.

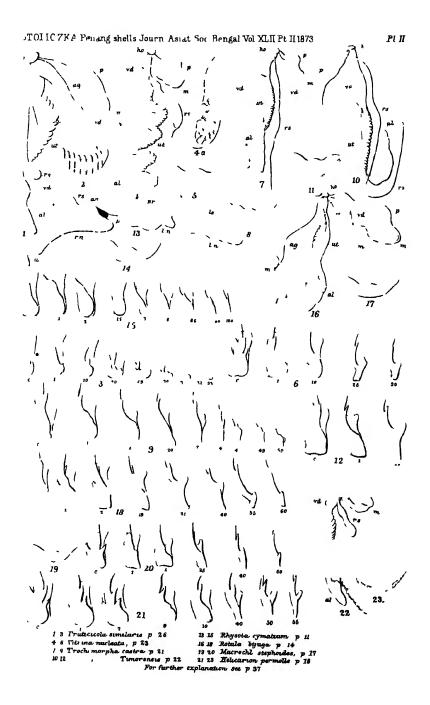
Description. Head and crest, neck, chin and throat, bluish black; the black of the throat extends about 0.6 of an inch from base of lower mandible; cheeks and ear coverts, and sides of the neck beyond ear coverts, form a patch of pure white; there is also a large patch of pure white on the back of the neck; on the sides of the neck below the white patch the black extends about \(\frac{1}{2}\) of an inch lower down than it does on the centre of the breast; back and wing coverts dark bluish grey, becoming paler and more ash coloured on the upper tail coverts; lesser and greater wing coverts tipped with bright white; wings and tail dusky, the feathers having paler edges; wing lining, axillaries and breast a clear ochre passing to a dusky yellow grey on the flanks, lower abdomen, and under tail coverts. This fulvous lower surface is characteristic of the species. Bill black; legs and feet dusky.

Total length judging from the skins, will be about 4 inches.

No.	Length of skin.	Wing.	Tail.	Bill at front.	Tarsus.	Midtoe and claw.	Hindtoe and claw.
1	3.7	2.25	1.76	•32	·68	·5	48
2-	3·5	2.13	1.78	•3	•66	•5	∙5

This species strikingly resembles in colouration the plate of *Parus Britannicus*, Sharpe and Dresser, in their fine work on the Birds of Europe; except that it is almost devoid of the greenish tint of the upper parts shewn in the plate, and our species is not a typical *Parus*, but a crested *Lophophanes*. It is also rather like Hodgson's drawing of *Parus oemodius*; but that species is not shewn to be crested, neither has it any white spots on the wings.

I picked this species out of a collection of Sikkim birds, sent by Mr. Mandelli to Mr. Ball. The discoverer allows me to describe it, and I have, therefore, great pleasure in naming it after my friend Mr. Hume, as I cannot remember any species named after the most laborious of our present Indian Ornithologists.



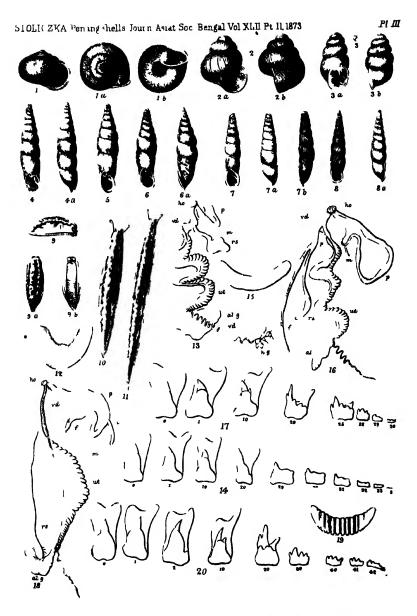
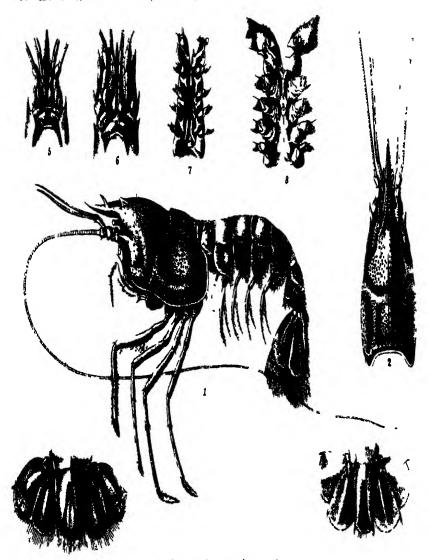


Fig I 18.20 Trachia Penangensis p 24
2 Pupa orcella p 33
3 . palmira p 32

^{4 6, 15 17} Clausilia Penangenes, p 27 7-8 Clausilia filicostata, p 28 9 14 Philomycus pictus p 30



Nephropsis Stewarts (see p 44)

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PI VI

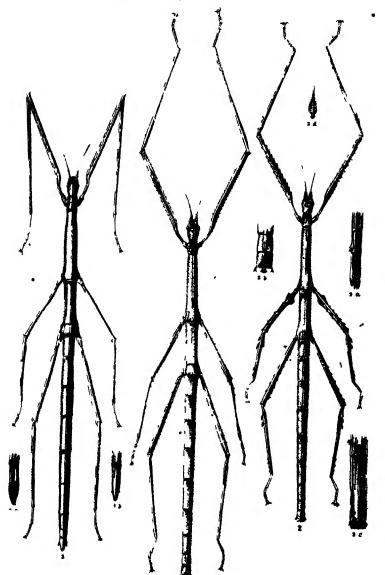


Fig 1-2 B Artemas p 51 Fig 3 B Westwooder, p 50

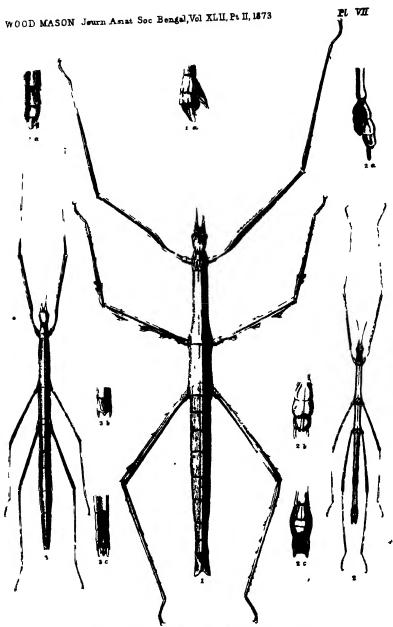


Fig. 1. B scabruseculus, p. 55. Fig. 2-3 B. hispidulus, p. 47.

Per further explanation seep 56.

JOURNAL

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Part II.-PHYSICAL SCIENCE.

No. II.-1873.

NEW BURMESE PLANTS. PART II,—by S. Kurz, Esq [Received 15th Fob , read 5th March, 1873.]

[With plates VIII, IX, X.]

TERNSTROEMIACEÆ.

106 ANNESIEA MONIICOLA, nov sp

Arbor 60-90 pedalis v. in regionibus altioribus pumila, glaberrima; folia c. 3 (arboris juvenilis usque ad 7) poll. longa, ovato-oblonga, raro lanceolata, basi rotundata v obtusa et subdecurrentia, breve lateque petiolata, acuminata v. acuta, integra v obsolete crenata, crassissime coriacea, nervis vix visibilibus, subtus (in seco) atropunctata; flores majusculi, basi bibracteolati, pedicellis 2, sub fructu usque 3 poll longis crassis albis ramulos terminantibus, calyx coriaceus, albus; corolla rosea. Martaban.—A. crassipedi arcte affinis, pedunculis et foliis acutis distinguitur.

107. SAURAUJA ARMATA, nov. sp.

Arbor 25-30 pedalis, novellis squamis adpressis firmis subosseis acutissimis vestita; folia 9-10 pollicaria, lato-ovata ad obovato-oblonga, acuta, basi obtusa, brevissime petiolata (petiolis crassis squamatis), spinessis serrata, chartacea, glabra, sed subtus secus costam nervosque squamis subosseis adpressis adspersa; flores 1½ poll. fere in diametro, in pedunculis brevissimis crassis dense squamatis solitarii, vulgo supra foliorum delapatatis cicatricibus fasciculati; sepala tomento squamis rigidis adpressis intermitis obducta; ovarium unacum parte unita stylorum 5 dense villosum.

108. SAURADJA MACROTRICHA, nov. sp.

Partes omnės (superficie foliorum excepta) pilis longis rigidis ferrugineis v. nigrescentibus vestitæ; folia fere pedem longa v. breviora, lanceolata, utrinque attenuata, breviuscule petiolata (petiolis hireutis), acuminatissima, setaceo-serrata, chartacea, supra glabra, subtus inprimis secus nervos venulosque rigide hirsuta; flores parvi, longe graciliterque pedicellati, in axillis foliorum v. supra eorum cicatricibus cymas hirsutas formantes; bracteæ parvæ, lineari-lanceolatæ, glabræ; sepala et ovarium glabra; styli 5, erecti, basi uniti.—Ava. (J. Anderson.)

109. PYRENARIA DIOSPYRICARPA, nov. sp.

Arbuscula novellis tomentellis; folia 4-5 poll. longa, oblongo-v. elliptico-lanccolata, basi acuta et marginibus utplurimum involutis, breve petiolata (petiolis crassis dense tomentosis), obtusa v. subobtusa, coriacca, juniora utrinque, denuo subtus tantum dense tomentella v. pubescentia, flavescenti viridia, in sicco more Symploci lutescentia; flores mediocres, brevissime et crasse pedicellati, solitarii, axillares; bractea sepalis longiores, foliacea, oblongo-lanceolata, basin versus attenuata et cum basi latissima sessiles; sepala bracteis conformia, sed minora et gradatim in petala extus denso sericea abeuntia; ovarium dense sericeo-villosum; styli 5, apice liberi, crassi et breves; drupa pomiformes, 2 poll. circiter longa, obovato-oblonga, obsolete obtuseque 3-4-angulares, carnosa, lævissima et cerino-lutea, nitentes, basi Diospyrorum more bracteis sepalisque paullulo accretis sustenta.—Martaban.

DIPTEROCARPEÆ.

110. SHOREA FLORIBUNDA (Hopea floribunda, Wall. Cat. 964).

Arbor verosimiliter decidua, glaberrima; folia juniora oblonga ad elliptica, basi rotundata, petiolis mediocribus gracilibus suffulta, acuta, glabra; flores mediocres, subsessiles, racemosi, in paniculas glaberrimas in axillis foliorum novellorum dispositi; calycis lævissimi lobi 2 interiores paullo breviores; petala semipollicem fere longa, lutescentia?, lanceolata, extus parce pubescentia; stamina c. 15, connectivo in aristam reflexam antheræ longitudine terminato.—*Tenasserim*. (Wall.).

111. HOPEA GRIFFITHII, nov. sp.

Glabra; folia ovato-lanceolata, breviuscule sed gracilius petiolata, basi acuta, longe et obtusiuscule caudato-acuminata, coriacea, subtus subnitentia et costa acute prominente percursa, nervis autem lateralibus 12-10 utrinque subtilibus; flores minimi, subsessiles, secundi, flexuoso racemosi, paniculam glabram brevem sed gracillimam formantes; calyx glaber, lobis lato-rotundatis et obtusis; petala extus velutina, lineam circiter longa; antheræ breves arista rigida antheræ longitudine v. longiore terminatæ.—*Tenasserim* (Helf. 717).

H. jucundæ, Thw. arcte affinis a qua autem foliorum-nervatione valde diversa jam dudum recognoscenda.

112. HOPEA GRATISSIMA, Wall. Cat. 960.

Glabra; folia lato-lanceolata, graciliter petiolata, basi acuta, breve et obtusiuscule apiculata, coriacea, supra lucida, nervis 15-16 utrinque subparallelis unacum costa acute prominentibus: flores secundi, breve pedicellati, racemos compositas terminales axillaresque parce puberulos formantes; calyx velutinus, lobis lanceolatis obtusis; petala extus velutina, 2 lin. longa; connectivum arista longa flexuosa terminatum.—*Tenasserim*. H. diversifolia, Miq., quam maxime affinis, an synonyma?

113. Anisoptera glabra, nov. sp.

Arbor ingens, 100-120 pedalis, glabra; folia circ. 5 poll. longa, elliptica ad oblonga, raro obovato-oblonga, breve acuminata, basi rotundata v. obtusa, coriacea, utrinque glabra, nervis subtus valde prominentibus; petiol. 1—1½ poll. longi, glabri; racemorum pedunculi ferruginoo-tomentosi, glabrescentes; flores desunt; calycis tubus fructigerus glaber, nuci tomentosæ fero ad 2/3 part. adnatus; calycis laciniæ inequales, quarum 2 longiores c. 6 pollicares, lineari-lanceolatæ, obtusæ, basim versus sensim attenuatæ, conspicue 3-costatæ et transverse venosæ, glabræ (costis minute tomentosis exceptis); interiores 3 strictæ, crectæ, lineari-lanceolatæ, pollicem fere longæ acuminatæ, basin versus latiores; nux velutina stylo longo acuminata.—Martaban. A marginatæ, Korth., cui Shoream Penangianam, Wall. Cat. 963, synonymam adscriberem, affinis.

MALVACEÆ.

114. BOMBAX INSIGNIS, Wall. Pl. As. rar. I. 71. t. 79-80.

Species haud cum B. Malabarica conjungenda, sed inter alia staminibus bene distinguitur:

B. Malabarica: staminum phalanges o filamentis crassis 15-20; B. insignis, autem e filamentis 50 pluribusve filiformibus compositæ.

STERCULIACEÆ.

115. HERITIERA MACROPHYLLA, Wall. MS.

Arbor, omnibus partibus argenteo-lepidotis; folia magna, ovato-oblonga v. oblonga, petiolis parce lepidotis 2-4 poll. longis v. raro brevioribus, basi rotundata et sæpius leviter sinuata, 7-12 poll. longa, acuta v. breve acuminata, coriacea, supra glabra, subtus argenteo-lepidota; flores parvi, dense fulvo-puberuli, 5-raro 7-denticulata, breve pedicellati paniculas axillares amplas ramosas dense fulvo-puberulos formantes; carpella lignosa, suboblique ovalia, canescenti-lepidota et pustulis suberosis rugoso-scabra, facie interna conspicue, extus obsolete carinata, apice in appendicem longiusculum coriaceum

alæformem producta.—*Martaban*. N. B. *H. attenuata*, Wall., Cat. 1140; Horsf. et Benn. H. Jav. rar. 237, a me non visa, vix hujus generis sed probabiliter cum *Brownlowia lanceolata*, Bth., comparanda.

116. HELICTERES OBTUSA, Wall. Cat. 1184.

Fruticulus partibus omnibus fulvo-tomentellis; folia oblonga ad oblongo-lanceolata, brevissime petiolata, basi obtusa v. rotundata ibidemque 3-nervia, 2-2; poll. longa, in eademque stirpe obtusa v. acuta et vulgo mucronata, chartacea, integra, supra pilis brevibus stellatis adspersa, subtus fulvescenti stellato-tomentella; flores parvi, breve pedicellati; cymæ fulvo-tomentellæ, brevissimæ, axillares, paucifloræ, graciles; calyx circ. 2 lin. longus, stellato-tomentellus et subfurfuraceus; petala sublongiora; staminum columna glabra; capsulæ oblongæ, breves, circ. 7-8 lin. longæ, dense villoso-muricatæ, carpellis inter se arcte coherentibus obtusis v. subobtusis.—Martaban, Tenasserim. H. lanceolatæ, DC. (

H. virgata, Wall.) affinis.

117. PTEROSPERMUM ACEROIDES, Wall. Cat. 1171.

Arbor, novellis dense tomentosis; folia elliptica v. lato-oblonga, utplurimum subobliqua, arboris junioris palmato-5-7-loba, breviuscule petiolata, profunde et saepius inaequali-cordata, verosimiliter nunquam peltata, brevo acuminata v. apiculata, supra glabra, subtus canescenti v. fulvescentitomentosa, basi 5-7-nervia; stipulæ...; flores magni, albi, breve crasseque pedicellati, 3-v. 2-ni axillares et subcymosi; bracteolæ oblongo-lauceolata, tomentosæ, integræ; calyx 2-3 poll. longus, sepala crassissime coriacea, linearia, ferrugineo-tomentosa, extus striata, intus fulvo-stellato pubescentia; stylus glaber; ovarium fulvescenti-tomentosum; capsulæ 5-angulares, oblongæ.—Tenasserim, Andamans.

TILIACEÆ

118. BERRYA MOLLIS, Wall. Cat. 1186.

Arbor magna, novellis tomentellis; folia cordato-rotundata, lata, circ. 6-7 poll. longa et lata, basi palmato-7-9-nervia, petiolata, petiolis 4-5 poll. longis dense puberulis v. tomentellis, obtusiuscula v. acuta, obsolete repanda et in lobos 2-3 breves obtusos producta, chartacea, adulta supra (nervis pubescentibus exceptis) glabra, subtus dense puberula v. subtomentosa; flores c. 4-5 lin. in diametro, albi, paniculas laxas fulvo-tomentosas terminales formantes; pedicelli longi, tomentosi; calyx extus dense tomentosus, profunde 2-3-fidus, in alabastro subglobosus; petala obovato-lanceolata, calyce longiora; stamina numerosissima et conferta; stylus simplex, glaber; ovarium villosum; capsulæ unacum alis oblique oblongis nervosis c. 2-2½ poll. in diametro, tomentellæ, siccæ, brunneæ; semina globosa.—Pegu, Martaban.

119. GREWIA SCABRIDA, Wall. Cat. 1113 (pro parte).

Frutex? novellis ferrugineo-tomentellis; folia oblonga v. ovato-lanceolata, 5-6 poll. longa, petiolis brevibus ferrugineo-tomentosis, basi obtusa v. rotundata, serrata, acuminata, chartacea, utrinque (præsertim subtus) stellato-hirta et scabra, 3-nervia, venis transversis valde conspicuis ; flores circ. 8-10 lin. longi, pedicellis sulcatis ferrugineo-tomentosis et subfurfuraceis, 2-3-pi cymas parvas ferrugineo-tomentosas axillares formantes; sepala 7-8 lin. longa, lineari-lanceolata, extus scabriuscule ferrugineo-tomentella; petala circ. 2 lin. longa, lamina oblongo-lanceolata obtusa et a foveola lata crassa dense fulvo-villosa usque ad basin fere separabilis; gynophorum et ovarium fulvo-villosa; drupæ profunde 4-lobæ, sed sæpe loborum unus alterve abortivus, lobis obtusis et divergentibus parce hispidis glabrescentibus, pollicem fere in diametro; mesocarpium fibrosum, coccis monospermis.--Martaban, Tenasserim. Species G. odoratæ, Bl. (G. umbellata, Roxb.) et G. columnari, Sm. valde affinis, sub codem nomine cum G. pilosa, Lamk., a cl. Wallichio distributa indeque a Wightio et Arnotto cum eadem confusa. G. retusifolia, Kurz in hocce diario, 1872, p. 294 proposita, foliis profunde retusis in sinu mucronatis insignis, teste cl. Mastersio ad G. humilem, Wall, speciem nondum descriptam, pertinet.

120. Grewia Microstewwa, Wall. ap. Voigt. Cat. Hort. Suburb. Calcutt. 128.

Frutex novellis scabro-puberulis; folia oblonga v. ovato-lanceolata, basi inequali-rotundata, brevissime petiolata, 5-7 poll. longa, acuminata, duplicato-serrato-dentata, chartacea, utrinque (præsertim subtus) scabro-puberula, 3-nervia, cum nervo adjecto ad latus latius; stipulæ petiolis fulvo-tomentosis longiores, subulatæ, strictæ, scabro-puberulæ; flores parvi; pedicelli tomentosi, breves; cymæ multifloræ brevissime pedunculatæ 2-3-næ axillares; sepala circ. 2 lin. longa, fulvo-puberula; petala lineari-lanceolata, 1 lin. longa, longitudine foveolæ ovalis villoso-ciliatæ incrassatæ, dorso linea hirsuta notata; stamina in floribus masculis 16; ovarium hirsutum; drupæ...—
Pequ.

121. COLUMBIA FLORIBUNDA, (Grewia floribunda, Wall. ap. Voigt. Cat. Hort. Suburb. Calc. 128; Glossospermum? 5-alatum, Wall. Cat. 1154 et 7841).

Frutex scabro-stellato-hirtellus; folia rotundata v. lato-obovato-oblonga, basi vulgo cordata, petiolis longiusculis gracilibus scabris, acuta v. breve acuminata v. obtusa, apicem versus sæpius in lobos 2 v. unicum obtusum v. truncatum raro acutum producta, distanter dentata, basi vulgo 7-nervia, membranacea, supra stellato-scaberrima, subtus plus minus pilis stellatis puberula et mox scabrescentia; flores parvi, pedicellis gracilibus brevibus

tomentellis, in cymulas pedunculatas dispositi et paniculam terminalem laxam canescenti-puberulam efficientes; sepala lineam circiter longa, extus canescenti-tomentella; petala obovato-oblonga, obtusa, sepalis subæquilonga, basi foveola minuta incrassata villoso-ciliata aucta; capsulæ 7-9 lin. in diametro, stellato-puberulæ, scabræ, siccæ, maturæ in carpidia 3-4 indehiscentia monosperma bialata separantes.—Ava, Martaban.

122. Evodia viticina, Wall. Cat. 1219.

Frutex? glaber, ramulis lineis 4 acute prominentibus notatis; folia 3-v. uni-foliolata in codem v. diversis ramulis, opposita, glabra, petiolis $\frac{1}{3} - \frac{3}{4}$ poll. leviter alatis; foliola 2-3 $\frac{1}{3}$ poll. longa, lanceolata v. obovato-lanceolata, basi attenuata et subsessilia, membranacea, breve acuminata, subtus pallida; paniculæ contractæ et parvæ, puberulæ, petiolis v. multo breviores v. subæquilongæ; flores parvi, brevissime pedicellati; petala 4, lineari-oblonga, obtusa, subcoriacea; carpella...—Tenasserim.

123. LIMONIA ALTERNIFOLIA, Wall. ap. Voigt. Hort. Calcutt. 139.

Fruticulus gracilis, simplex v. parce ramosus, deciduus, inermis, glaberrimus; folia impari pinnata, rachide anguste alata; foliola 5-7-juga cum impari, alterna, subsessilia, oblongo-lanceolata ad lanceolata, oblique acuminata, crenata, glabra, 1-1½ poll. longa, pellucido-punctata; flores pentameri, parvi, albi, e ramulis novellis axillaribus brevibus orientes et cymam brevem glabram breve pedunculatam v. subsessilem efformantes; calycis lobi trigono-oblongi, acuta, ½ lin. longi; petala 3 lin. longa, acutiuscula; stamina 10, alternatim breviora, filamenta basi intus parce puberula; ovarium obovatum, compressiusculum, læve, toro brevi crasso insidens, 2-loculare, loculis ovulo solitario pendulo; stylus curvus, stigmate incrassato; torus post præflorationem productus; baccæ....—Pegu.

SIMARUBEÆ.

124. Brucea mollis, Wall. MS.

Fruticulus simplex v. subsimplex, 2-3 pedalis, novellis puberulis v. pubescentibus; folia imparipinnata, petiolus rachisque teres puberuli, glabrescentes; foliola 4-6-juga cum impari, ovato-oblonga v. ovato-lanceolata, longiuscule petiolulata, acuminata, integerrima, membranacea, supra sparse, subtus densius, pubescentia v. præter nervos pubescentes glabra, 2-3 poll. longa; flores minuti, graciliter pedicellati, racemos puberulos v. pubescentes simplices graciles folio multo breviores axillares formantes; drupæ solitariæ v. binæ, rarius ternæ, ovatæ, pisi majoris magnitudine v. majores.—Martaban. Brucea genus magis ad Tapiriam inter Anacardiaceas spectat.

MELIACEÆ.

125. CHICKRASSIA VELUTINA, (Swietenia velutina et S. villosa, Wall. Cat.).

Species mihi bona, a Ch. tabulari distinguitur novellis, foliis etc. molliter pubescentibus, foliolis numerosioribus supra velutinis subtus molliter pubescentibus; paniculis ferrugineo-tomentosis; floribus majoribus; petalis obovato-oblongis 5-6 lin. longis; calyce dense fulvo-tomentoso; capsulis atris, sublavibus.—Pegu, etc.

CELASTRINEÆ.

126. MICROTROPIS LONGIFOLIA, Wall. Cat. 4339 (pro parte).

Frutex? glaber; folia oblongo-lanceolata v. oblonga, petiolis crassis 4-5 lin. longis, breve acuminata, basi acuta, 6-7 poll. longa, integra, coriacea, utrinque (præsertim supra) rugulosa, opaca; flores breve cymosi; pedunculus 4-6 lin longus; capsulæ obovatæ; testa seminis rubra.— Tenasserim. G. latifoliæ, Gais., in Hb. Kew assimilis, nervatione autem diversa.

AMPELIDEÆ.

127. LEEA COMPACTIFLORA, nov. sp.

Arbuscula *L. sambucinæ* valde affinis, sed foliola angustiora, argute serrato-dentata, longe acuminata; inflorescentia petiolo multo brevior, ferragineo-tomentosa; flores viridiusculi, sessiles, bracteis latis brevibus ovatis acutis subscariosis circumdati et in glomerulos compactos congesti; fructus non adsunt.—*Martaban*.

128. LEEA GIGANTEA, Griff. Not. Dicot. 697. t. 645, f. 3.

Frutex simplex, elatus, glaberrimus; folia largissima, supra-decomposita, petiolus compressiusculus lævis; foliola vulgo magna, 6-8 poll. longa, petiolulis \(\frac{1}{4} \) (terminali usque ad 2) poll. longis, oblonga ad oblongo-lanceolata, breve et abrupte acuminata, basi acuta, grosse crenato-serrata, tenuicoriacea, glaberrima, lucida, siccando nigrescentia, nervis subtus prominentibus; flores parviusculi, virescenti-albidi, pedicellis brevissimis robustis v. subsessiles, in cymam amplam diffusam 2-3-chotomice ramosam glaberrimam axillarem v. subterminalem petiolorum longitudine v. longiorem dispositi; bracteæ bracteolæque ante anthesin caducissimæ; calycis lobi breves, rotundati v. subacuti, glabri; petala reflexa, lineam circiter longa; lobi tubi staminum triangulari-lanceolati, acuminati, apice integro reflexi; baccæ depresso-globosæ, 4-6 spermæ; semina obtuse carinata, lateribus tuberculato-costatis.—Tenasserim.

129. LERA LETA, Wall. Cat. 6831.

Frutex humilis, 2-3 pedalis, glaber; folia bipinnata, petiolis teretibus; foliola petiolulis 1-2 lin. longis, oblongo-ad ovato-lanceolata, 5-8 poll. longa,

basi rotundata subinequalia, acuminata, crenato-serrata, membranacea, glabra siccando magis minusve rubescentia; flores parvi, rubri, pedicellis brevibus tomentosis, cymas compositas breves sessiles v. pedunculatas compactiusculas v. raro diffusas axillares efficientes; bracteæ bracteolæque ante anthesin caducæ; calycis lobi triangulares, acuti, glabri; petala lineam fere longa; tubi staminei lobi emarginati; baccæ desunt.—Burma, Andamans.

130. LEEA SANGUINEA, Wall. ap. Voigt. Cat. Suburb. Calcutt. 30.

Herba perennis, caulibus crassis teretiusculis, glabra; folia inferiora decomposita, superiora impari-pinnata, summa sæpius ternata, petiolis, petiolulis rachique anguste membranaceo-4-alatis; foliola vulgo 3-juga cum impari, elliptico-oblonga ad oblongo-lanceolata, terminali longius petiolulato sæpius ovato-oblongo, brevissime petiolulata v. subsessilia, 6-8 poll. longa, acuta, argute serrata, glabra, nervis parallelis venisque transversis subtus valde prominentibus; cymæ vulgo a basi ramosæ v. pedunculatæ, trichotomo-ramosæ, pedunculis et ramificationibus purpurascentibus compresso-angulatis glabris; bracteæ, bracteolæque ante anthesin deciduæ; flores parvi, coccinei, pedicellis brevibus crassis glabris suffulti; calyx 5-dentatus, coccineus, lobis acutis; petala coccinea, lincam circiter longa; tubus stamineus cerino-albus, lobis emarginatis; filamenta subpurpurascentia; baccæ depresso-globosæ, pisi magnitudinis, vulgo 6-spermæ, aurantiacæ.—Ava.

N. B.—Vitis Wallichii, Kurz in hocce diario 1872, p. 302 (Leea cordata, Wall. Cat. 6819) ad V. Linnæi formas probabiliter reducenda, a quibus autem cymis axillaribus (nec oppositifoliis) differre videtur.

ANACARDIACEÆ.

131. MANGIFERA CALONEURA, nov. sp.

Arbor mediocris, glabra; folia oblonga ad oblongo-lanceolata, 3-5 pollicaria, petiolo basi valde incrassato 1-\frac{1}{2} poll. suffulta, obtuse acuminata, coriacea, glabra, utrinque elegantissime minute et prominenter reticulata, costà crassa lata præsertim supra prominente et subplana percursa, nervis lateralibus vix curvis 18-20, tenuibus; flores parvi, sessiles v. subsessiles paniculam terminalem tomentosam amplam formantes; calyx pubescens; petala lanceolata, acuta, reflexa, lineam circiter longa, ciliolata, alba, medio linea citrina percursa; stamen 1, anthera atropurpurea; discus 5-lobus, lævis; drupæ ovi gallinacei magnitudine subreniformi-ovoideæ, læves, obtusæ, aurantiacæ v. luteæ, acido-dulces, subteretes.—Pegu, Martaban. M. Indicæ affinis, reticulatione elegantissima statim recognoscenda.

N. B.—Bouea Brandisiana, Kurz in Journ. As. Soc. 1871, p. 50, ad B. Burmanicam, Griff. in hocce diario, 1854, p. 634, referenda.

LEGUMINOSÆ.

132. MILLETTIA MONTICOLA, nov. sp.

Frutex alte scandens, deciduus, novellis parce ferrugineo-pubescentibus glabrescentibus, ramis verrucosis; folia novella (adulta non visa) imparipinnata; foliola 4-3-juga cum impari, petiolulata, oblonga, breve acuminata, subtus secus nervos adpresse fulvo-pubescentia; flores azurei, parviusculi, pedicello 1-2 lin. longo ferrugineo-tomentoso suffulti, fasciculati, in racemos simplices solitarios ferrugineo-tomentellos 4-7 pollicares supra foliorum delapsorum cicatricibus orientes dispositi; calyx parce ferrugineo-tomentosus, 2-2½ lin. longus, longior quam latus, obsolete et lato-dentatus, denticulo anteriore paullo producto; corolla glabra, vexillo circiter semipollicari; ovarium tenuiter ferrugineo-pubescens; legumina desunt.—Martaban. M. pachycarpæ, Bth., arcte affinis.

133. MILLETTIA LEIOGYNA, nov. sp.

Frutex deciduus alte scandens novellis ferrugineo-tomentosis; ramis teretibus minute lenticellatis; folia novella (adulta desunt) ferrugineo-tomentosa, impari-pinnata; foliola 4-6-juga cum impari; flores majusculi, violacei, vexillo in fundo luteo, pedicellis 2-3 lin. longis nutantibus velutinis suffulti, racemos 4-5 pollicares fulvo-tomentosos e ramulis abbreviatis lateralibus ortos formantes et sæpius in paniculam amplam lateralem collecti; calyx latior quam longus, 2-2½ lin. longus, fulvo-velutinus, obsolete dentatus, dente anteriore paullo producto; corolla glabra, vexillum ½ poll. longum, emarginatum; ovarium læve; legumina juniora linearia, læves, subulato-acuminata.—Murtaban. M. extensæ, Bth., affinis.

134. MILLETTIA GLAUCESCENS, nov. sp.

Arbor magna, decidua, glabra v. sæpius novellis parce pubescentibus; folia impari-pinnata, ½-1 ped. longa, glabra, v. rachi et petiolulis parce puberulis; folia elliptica ad obovato-oblonga et oblongo-lanceolata, vulgo 3-4-raro 2-juga cum impari, obtusiuscule et subabrupte acuminata v. apiculata, petiolulis 2-3 lin. longis gracilibus glabrescentibus, integra, 3-4 poll. longa, membranacea, glabra v. subtus secus costam subpubescentia, subtus glaucescentia; flores parviusculi, cyanci, pedicellis capillaribus puberulis v. subglabris 3-4 lin. longis, in racemos graciles glabros v. puberulos solitarios v. secus ramulos novellos aphyllos aggregatos dispositi; calyx latior quam longus, parce pubescens, 1-1½ lin. longus, obsolete lato-dentatus; corolla glabra; vexillum obsolete emarginatum, ½ poll. fere longum; ovarium adpresse sericeum; legumen oblongum, basi attenuatum, lignosum, incurvato-acutum, planum, suturis in alas angustissimas dilatatis undeque quasi subquadrangulari-alatum, glabrum, lenticellis rimosis sparse obtectum, 3-4 poll. longum, 2-3 lin. crassum, 1-3-spermum.—Pegu, Martaban.

135. MILLETTIA PUBINERVIS, nov. sp.

Arbuscula 20-25 pedalis, novellis puberulis; folia impari-pinnata, c. \(\frac{1}{2}\) ped. longa, rachi puberula; foliola elliptico- ad obovato-oblonga, petiolulis gracilibus 1-2 lin. longis puberulis, longiuscule et obtusiuscule acuminata, 2-3 poll. longa, tenuiter chartacea, integra, subtus glauca et secus costam pubescentia; flores parviusculi, luride lutescenti albi, pedicellis capillaribus pubescentibus, solitarii v. fasciculati, racemos solitarios oppositifolios graciles luteolo-pubescentes 2\(\frac{1}{3}\)-3 poll. longos formantes; calyx rubicundus, latior quam longus, circ. 1-1\(\frac{1}{3}\) lin. longus, parce pubescens, obsolete sinuato-dentatus; corolla glabra; vexillum plus quam \(\frac{1}{3}\) poll. longus; ovarium adpresse pubescens; legumen deest.—Martaban.

136. MILLETTIA LEUCANTHA, nov. sp.

Arbor mediocris, novellis sericeo-pubescentibus glabrescentibus; folia impari-pinnata, \(\frac{1}{2}\cdot^2\) ped. longa, juniora subtus sparse pubescentia, mox glabrescentia; stipellæ subulatæ, rigidæ, diutius persistentes; foliola ovata ad elliptica, utplurimum 3-juga cum impari, longius petiolulato, breve et subabrupte acuminata, petiolulis c. 2 lin. longis puberulis glabrescentibus, 3-4 poll. longa, rigide chartacea, adulta glaberrima, integra, subtus sæpius pallida; flores fasciculati majusculi, candidi, pedicellis 2-3 lin. longis cinereovelutinis; racemi solitarii, cinerascente pubescentes, erectiusculi, 2-4 poll. longi, in ramulis lateralibus terminales v. laterales; calyx canescenti-velutinus, c. 2\(\frac{1}{2}\) lin. longus, dentibus 3 inferioribus distinctis, acutiusculis, 2 superioribus connatis lato-ovatis; corolla glabra; vexillum \(\frac{1}{3}\) poll. fere longum, integrum; ovarium adpresse sericeum; legumen lignosum, oblongum ad obovato-oblongum, acutum, glabrum, lenticillato-scabrum, 1\(\frac{1}{2}\)-3 poll. longum, marginibus uti in Pongamia obtusis, 1-3 spermum; semina plana, brunnea.—Prome, Pegu.

137. MILLETTIA OVALIFOLIA, (Pongamia ovalifolia, WA. Prod. I. 262; Wight Jc. t. 328.)

Arbor mediocris, glabra; folia impari-pinnata, \(\frac{1}{2}-\frac{1}{2}\) ped. longa, glabra; foliola ovata ad elliptica et elliptico-ovata, petiolulis 1-2 lin. longis gracilibus, 3 (sec. WA. etiam 4-)-juga čum impari, breve acuminata, apiculata v. obtusiuscula, \(\frac{1}{2}-1\) poll. longa, chartacea, integra, subtus subglaucescentia, subtiliter reticulata; flores solitarii v. subfasciculati cyanei, parviusculi, pedicellis capillaribus 2-3 lin. longis; racemi graciles, glabri, 2-3 poll. longi, solitarii v. plures e ramulis novellis orti; calyx glaber, purpurascens, latior quam longus, c. 1 lin. longus, obsolete dentatus v. subtruncatus; corolla glabra, vexillum c. \(\frac{1}{2}\) poll. longum; ovarium parce adpresse pubescens; legumen lineari-oblongum, basin versus attenuatum, incurvato-acutum, planiusculum suturis obtusis, sublignosum, glabrum, pallidum, sparse verrucoso-lenticillatum, 2-3 poll. longum, ad medium 2-3-spermum.—Prome.

138. MILLETTIA BRANDISIANA, nov. sp.

Arbor mediocris, gemmis cupreo v. fulvo-pubescentibus, cæterum glabra; folia impari-pinnata, 1-1 ped. longa, glabra; stipellæ subulatæ, diutius persistentes; foliola 7-10-juga cum impari, oblongo-lanceolata, petiolulis lin. longis puberulis, obtuse acuminata, 1\frac{1}{2}-2\frac{1}{2} poll. longa, integra, juniors membranacea et subtus parce minuteque puberula, demum rigide sed tenuiter coriacea, glaberrima, subtus glaucescentia; flores cyanei, majusculi, pedicellis crassiusculis 2-3 lin. longis glabris suffulti, fasciculati, racemos 4-8 poll. longos glabros secus ramulos novellos distributos formantes; calyx purpureus, glaber, c. 2 lin. longus, tomentoso-fimbriatus, dentibus conspicuis, anteriore magis producto, posterioribus brevibus lateque connatis; corolla sericeo-pubescens; vexillum \frac{1}{2} poll. fere longum; ovarium adpresse pubescens; legumen obovato-oblongum ad oblongum et oblongo-lanceolatum, basi plus minusve attenuatum, rigide coriaceum, valde planum, subabrupte incurvato-acuminatum, 2-3 poll. longum, suturis haud incrassatis, brunnescens, læve, 1-3-spermum.—Pegu. M. pulchræ (= Mundulea pulchra, Bth.) affinis.

139. MILLETTIA TETRAPTERA, nov. sp.

Arbor mediocris, novellis molliter pubescentibus; folia impari-pinnata, \frac{1}{3}-\frac{2}{3} ped. longa, juniora molliter tomentella; foliola 3-(raro 2-1) juga cum impari, obovata ad elliptico-obovata, petiolulis crassis 1-2 lin. longis tomentosis, apice rotundata, subemarginata v. rarius apiculata, integra, novella membranacea et utrinque canescenti-tomentella, demum rigide chartacea et supra glabrescentia; flores fasciculati parviusculi, pallide lilacini, pedicellis 2-3 lin. longis dense pubescentibus; racemi 3-4 poll. longi, fulvo-v. gilvescenti-tomentosi secus ramulos foliatos novellos siti v. apicibus oppositifolii; calyx latior quam longus, 1\frac{1}{3} lin. longus, tomentosus, obsolete sinuato-dentatus v. subtruncatus; corolla glabra; vexillum c. \frac{1}{3} poll. longum; ovarium adpresse pubescens; legumen subcuneato-oblongum, basi sterili attenuatum, lignosum, incurvato-acutum, 3-4 poll. longum, pallidum, læve, marginibus in alas irregulares lignosas sæpius undulatas angustas dilatatum et quasi tetrapterum, 1-2 spormum.—Ana, Prome.

140. ERYTHRINA HOLOSERICEA, nov. sp.

Arbor aculcato-armata, novellis furfuraceo-puberulis; folia iis *E. litho-spermæ* conformia, 3-foliolata, petiolo 3-4 poll. longo, glabra: foliola plus minusve ovata, petiolulis 2-3 lin. longis, acuminata, 3-5 poll. longa, integra, chartacea v. membranacea, glabra; flores magni, coccinei? alis carinaque purpureis, subsessiles, 2-3-ni fasciculati, in racemo fulvo farinaceo-tomentoso collecti; calyx resupinatus, brevi-spathaceus brunneo-villosus, intus fulvescenți-sericeus; vexillum 1½ poll. fere longum, obovato-cuneatum, obtusum, minute-velutinum; alæ falcato-oblongæ, obtusæ, c. ½ poll. longæ; carina

c. † pollicaris, e petalis 2 oblique oblongis acutiusculis brove unguiculatis medio tantum connatis composita; stamina monadelpha; ovarium fulvotomentellum; legumen deest.—Pegu. Ex affinite E. lithosperma, Miq., (= E. Sumatrana, Miq.) vix Bl. cujus planta e Mauritio in Hort. Bog. allata fuerat. (cf. Bl. Cat. Buitenz.)

141. Dalbergia cana, Grah. in Wall. Cat. 5859.

Arbor magna, novellis pubescentibus glabrescentibus; folia impari-pinnata; juniora parce pubescentia, mox glabrescentia, 1-2 ped. longa; foliola 7-9-juga, alterna, petiolulis 1-1½ lin. longis glabrescentibus, oblonga ad ovato-v. lineari-oblonga, sæpius subinæqualia, breve et subabrupte acuminata, 2-2½ poll. longa, integra, chartacea, adulta glabra v. subtus subpuberula; flores parvi, luride purpurei, pedicellis capillaribus puberulis 1-2 lin. longis suffulti, paniculam laxam puberulam breve pedunculatam axillarem v. sub-lateralem formantes; calyx atropurpureus, glaber v. subglaber, c. 2 lin. longus, dentibus obtusis; corolla glabra, 3 lin. fere longa, petalis longe unguiculatis; stamina 10, diadelpha; ovarium pilosum; legumen lineari-oblongum, planum, 3-1-spermum, obtusum, basi in stipitem brevem constrictum 3-4 poll. longum, fulvo-velutinum, circa semina indistincte venosum.—Pegu Martaban, Tenasserim.

142. Dalbergia glomeriflora, nov. sp.

Arbor mediocris, decidua, novellis fulvescenti-tomentosis; folia juvenilia tomentosa glabrescentia, impari-pinnata; folia 3-4-juga, alterna, ovata ad elliptica et obovata, petiolulis parce pubescentibus 1-2 lin. longis, acuta, 2-2½ poll. longa, integra, tenuiter coriacea, supra glabra, subtus parce puberula; flores parvi, albi, pedicellis brevissimis, v. subsessiles, in paniculas subcapitatas ramulos novellos villosos terminantes conglomerati; calyx c. 1½ lin. longus, glaber, dentibus obtusis; corolla glabra, calyx paullulo longior, petalis brevissime unguiculatis; stamina 10, diadelpha; ovarium glaḥrum; legumen desideratur.—Prome.

ARILLARIA, gen. nov.

Calyx amplus, dentibus 2 superioribus paullo majoribus. Vexillum suborbiculare, alæ carinaque subconformes, securiformi-falcatæ; petala omnia breve unguiculata et libera. Stamina 10, libera, inæqualia, omnia fertilia; antheræ versatiles. Ovarium brevi et crasse stipitatum, 2-ovulatum; stylus filiformis, revolutus, stigmate laterali. Legumen oblongum, teres, carnoso-coriaceum, utrinque dehiscens. Semina 2 v. abortu utplurimum solitarium, magna, oblonga, nigra, arillo carnoso miniato complete involutum. Cotyledones crassæ, radicula centrifugalis.—Arbor foliis impari-pinnatis, foliolis oppositis stipellatis. Flores majusculi, albi, racemosi, in paniculas terminales collecti. Genus juxta Ormosiam ponendum, arillo insigne, unde nomen.

Chænolobii species ambæ a cl. Miquelio confectæ ad Ormosiam coarctatam, Jack, reducendæ.

143. A. ROBUSTA, (Sophora robusta, Roxb., Hort. Beng. 31; Wight Jc. t. 245; Ormosia floribunda, Wall. Cat. 5337.)

Arbor mediocris sempervirens, novellis fulvo-velutino-tomentosis; folia impari-pinnata, 1-1‡ ped. longa, rachi fulvescenti-pubescente; stipellæ persistentes, c. 2 lin. longæ, lineari-subulatæ, pubescentes; foliola 4-5-juga, oblonga, petiolulis crassis 2 lin. longis pubescentibus, acuta v. apiculata, 8-4 poll. longa, integra, tenuiter coriacea, adulta supra glabra, subtus fulvescenti-puberula; flores majusculi, luride albi, pedicellis brevibus crassis tomentosis suffulti, racemosi, in paniculam terminalem robustam ferrugineo-v. fulvo-tomentosam collecti; bracteæ persistentes, lineares, tomentosæ, 2-8 lin. longæ; calyx amplus, 3 lin. fere longus, dense tomentosus; corolla glabra, c. 3 lin. longæ; ovarium villosum; legumen oblongum v. elliptico-oblongum, basi in stipitem brevem pubescentem crassum contractum, acutum, carnoso-coriaceum, luteum v. gilvum, parce pubescens v. subglabrum, mono- rarissime 2- spermum; semen magnum, oblongum, atterrimum, lucidum, arillo miniato dein sanguineo carnoso complete involutum.—Pegu, Tenasserim.

144. PTEROLOBIUM MACROPTERUM, nov. sp. (P. lacerans, Miq. Fl. Ind. Båt. I. 106, non R. Br.)

Frutex magnus scandens, aculeis brevibus armatus, novellis parce pubescentibus; folia \(\frac{1}{2} - \frac{1}{4} \) ped. longa, abrupte bipinnata, pinnis 7-8 v. pluribus rachibus aculeatis puberulis; foliola 7-9- v. pluri-juga, subsessilia, inæquali-oblonga v. elliptico-oblonga, \(\frac{1}{3} - \frac{1}{4} \) poll. longa, apice rotundata v. retusa, membranacca, glabra, subtus pallida; flores albi, parvi, breviter pedicellati, racemos axillares solitarios (glabros?) efficientes; legumina samaroidea, basi seminifera plus quam \(\frac{1}{2} \) poll. longa, elliptico-oblonga, ala sesquipollicari, pollicem fere lata, semi-oblonga, apice rotundata, sutura interiori recta, nec arcuata.—Pegu, Martaban, Tenasserim.

Species Indicæ 3 mihi notæ, nempe, *P. microphyllum*, Miq. (Hb. Maingay No. 535) racemis in paniculas terminales amplas dispositis, et *P. lacerans*, R. Br. (Wight Icon. t. 196), cum specie nova supra descripta racemis axillaribus solitariis conjunctum, leguminibus autem valde discrepans.

145. Cassia renigera, Wall. Cat. 5307; Bth. in Linn. Trans. XXVII. 518.

Arbor mediocris, novellis molliter pubescentibus; folia abrupte pinnata, ‡-1 ped. longa, molliter pubescentia; stipulæ magnæ, lunato-reniformes, deciduæ; foliola 8-20-juga, petiolulis brevissimis, v. subsessilia, elliptico-oblonga ad oblonga, obtusa v. retusa cum mucrone minuto, ‡-1‡ poll. longa,

membranacea, molli-pubescentia; flores speciosi, purpurei, pedicellis 1-1½ pollicaribus pubescentibus, in racemos solitarios v. geminatos supra foliorum delapsorum cicatricibus ortos pubescentes brevissimos dense bracteatos collecti; bracteæ cordato-ovatæ, longe acuminatæ, pubescentes; calyx breve denseque pubescens; petala oblonga, pollicem fere longa, obtusiuscula; ovarium filamentaque glabra; filamenta longiores medio incrassata; legumen cylindricum, 1-2 ped. longum, indehiscens, glabrum.—Ava, Prome.

146. BAUHINIA ROSEA, nov. sp.

Frutex scandens, novellis fulvo-puberulis; folia cordato-rotundata, usque ad \(\frac{1}{3} \) partem biloba, lobis rotundatis cum arist\(\hat{a} \) brevi in eorum sinu auctis, petiolo \(1\frac{1}{2}\)-2 pollicari puberulo, 3-5 poll. longa et lata, integra, chartacea, juniora supra fugaci-pubera mox glabra, subtus fulvescenti puberula; flores parviusculi, rosci, pedicellis \(1\frac{1}{2}\)-2 poll. longis gracilibus adpresse puberulis, racemum terminalem bracteatum corymbiformem fulvo-pubescentem formantes; bracte\(\tilde{w} \) lineari-lanceolat\(\tilde{w} \), acuminat\(\tilde{w} \), c. \(\frac{1}{2} \) lin. long\(\tilde{w} \); calyx adpresse fulvo-puberulus, tubo brevi, lobis in alabastro tereti-ovoideis, dein liberis et reflexis \(4 \) lin. longis lineari-lanceolatis; petala longe unguiculata, obovato-linearia, undulata, utrinque parce adpresse pubescentia, c. \(\frac{3}{2} \) poll. longa; ovarium cum stylo crasso brevi (ovario breviore) fulvo-villosum; legumen deest.\(-Martuban. \) (Dr. Brandis.) \(A \) B. \(Vahlii \) inter alia differt stylo et floribus minoribus.

147. BAUHINIA ORNATA, nov. sp.

Frutex alte scandens cirrhiferus, novellis ferrugineo-pubescentibus; folia cordato-ovata ad cordato-rotundata, petiolo 1½-3 poll. longo in juventute ferrugineo-pubescente suffulta, usque ad ½ v. ⅓ partem biloba, lobis obtusius-culis v. obtusiuscule acuminatis et in sinu aristatis, 4-7 poll. longa et lata, integra, chartacea, juniora subtus parce adpresse ferrugineo-pubescentia, mox glabrescentia, palmatim 11-15-nervia; flores parvi, albi, pedicellis gracilibus 1-1⅓ pollicaribus, ferrugineo-pubescentibus, apice pedunculi longioris v. brevioris glabrescentis in racemum corymbiformem multiflorum bracteatum fulvo-pubescentem lateralem v. terminalem congregati; bracteæ lineari-lanceolatæ, pubescentes, c. 2 lin. longæ; calyx in alabastro pyriformis, adpresse pubescens, lobis ovatis c. 3 lin. longis reflexis; petala obovato-oblonga, extus parce pubescentia, subundulata, c. 4 lin. longa; ovarium fulvo-villosum, stylo longo gracilique glabro; legumen non repertum.—Pequ.

148. BAUHINIA INVOLUCELLATA, nov. sp.

Frutex scandens, novellis parce puberulis; folia cordato-ovata, petiolo glabro 1\frac{1}{2}-2 poll. longo, usque ad \frac{1}{2}-\frac{1}{2} partem biloba, lobis obtusiuscule acuminatis in sinu aristatis, 3-4 poll. longa, integra, tenuiter chartacea, glabra, palmatim 9-11-nervia; flores majusculi, pallide rosei, pedicellis 2-2\frac{1}{2} polli-

caribus puberulis glabrescentibus infra apice bibracteolatis suffulti, racemum longiorem v. breviorem laxum terminalem puberulum glabrescentem formantes; bracteæminutæ, indistinctæ; bracteolæ sub calyce elliptico-oblongæ, obtusiusculæ, ‡ poll. longæ, intus velutinæ, quasi involucrum bifoliatum formantes; calyx velutinus, tubo sulcato-tubulari, c. 3 lin. longus v. longior, lobis in alabastro oblongo-ovato lanceolatis acuminatis ‡ poll. longis dein liberis et reflexis; petala 1 } poll. fere longa, lamina ovato-oblonga, obtusa, unguis longitudine; ovarium læve, stylo longiusculo sed crasso; stamina fertilia 3; legumen desideratur.—Martaban (Dr. Brandis).

149. BAUHINIA MONANDRA, non. sp.

Frutex? novellis puberulis; folia parva, rotundato-ovalia, basi truncata, petiolo \(\frac{1}{3} \)-1 pollicari breve pubescente, usque ad \(\frac{1}{3} \) partem biloba, lobis rotundatis in sinu aristatis, \(1 \cdot 1 \frac{1}{3} \) poll. longa, integra, chartacea, supra glabra, subtus præsertim secus nervos breve pubescentia, palmatim 11-nervia; flores majusculi, albi? petalo inferiore maculato, pedicellis \(1 \cdot 1 \frac{1}{4} \) pollic. longis dense puberulis, racemos breves terminales pubescentes formantes; bracteæ parvæ, subulatæ; calyx extus tomentellus, in alabastro fusiformis, spathaceus; petala obovato-cuneata, c. \(1 \frac{1}{4} \) poll. longa, glabra, undulata, stamen perfectum unicum tantum, extera omnia rudimentaria; ovarium stipitatum fulvo-villosum, suturis lævibus, stylo gracili ovarii ipsius duplo longiore terminatum; legumen deest.—\(Burma, Martaban \(? \) (Dr. Brandis). Ex affinitate \(B. tomentosæ, cum \(B. brachycarpa, Wall., ultro comparanda.

150. AFZELIA RETUSA, nov. sp.

Arbuscula glaberrima; folia abrupte pinnata, rachi brevissima glabra; foliola uni- v. bijuga, plus minusve ovalia, sub-obliqua, brevissime petiolulata, 1½-2 poll. longa, integra, chartacea, emarginata, glabra; flores parviusculi, albidi pedicellis c. 4 lin. longis glabris, racemos breves simplices glabros in ramulis terminales efficientes; bracteolæ sub calyce 2 parvæ, concavo-cymbiformes, persistentes; calyx lævis, tubo c. 4-lin. longo, lobis obovato-oblongis æqui-longis; legumen 3-4 poll. longum, 1-1½ poll. latum tenuiter coriaceum, oblongum, secus margines incrassatos subcurvum, glabrum.—Andamans.

151. PARKIA LEIOPHYLLA, nov. sp.

Arbor vasta, 80-120 pedalis, novellis pubescentibus; folia abrupte bipinnata, 1-2 pedalia, pinnis c. 20 v. pluribus suboppositis, rachibus breve fulvo-pubescentibus; foliola c. 30-40, sessilia, opposita, lineari-oblonga, subfalcata, basi oblique auriculata, † poll. longa, c. 2 lin. lata, oblique acuta, tenuiter coriacea, glaberrima, unicostata cum nervo solitario basilari laterali, penninervia; flores parvi, flavescentes, in receptaculo irregulari-globoso basi

in stipitem pollicem fere longo contracto sessiles et capitulum densifiorum clavatum longe-pedunculatum formantes; pedunculi 1-1½ pedales, glabri, racemosi, terminales; calyx 4 lin. fere longus, tubo glabro, lobis rotundatis extus dense fulvo-tomentosis; legumen 1-1½ ped. longum, lineare, in stipitem ½-½ pedalem attenuatum, apice rotundatum, glabrum et subvernicosum, nigrum, inter semina numerosa torosum.—Pegu.

152. PARKIA INSIGNIS, nov. sp.

Arbor vasta, 80-100-pedalis, novellis fulvo-pubescentibus; folia abrupte bipinnata, 1-2-pedales, pinnis c. 8 suboppositis, rachibus fulvo-v. ferrugineo-tomentosis; foliola 20-25 juga, subopposita, subfalcata, oblonga, cum basi inæquali sub-auriculata sessilia, apice rotundata, 1 poll. longa, † poll. lata, integra, coriacea supra nervis exceptis glabra, subtus pubescentia, penninervia, nervis arcuatim anastomozantibus; flores parvi, lutci in receptaculo clavato-orbiculari basi in stipitem pollicarem attenuato sessiles et capitulum clavato-pyriformem longe pedunculatum efformantes; pedunculi pedales, plures ex apice ramorum orientes; calyx c. 4 lin. longus, tubo glabro v. subglabro, lobis obovato-cuneatis adpresse fulvo-pubescentibus; legumina non vidi.—Martaban.

153. ALBIZZIA (Pithecolobium) GLOMERIFLORA, nov. sp.

Frutex 2-5-pedalis, novellis puberulis, ramulis subangularibus v. teretibus; folia abrupte bipinnata, pinnis unijugis, petiolus 1-1½ pollicaris, rachibus vix angularibus presertim junioribus puberulis; foliola 3-raro 2-juga, petiolis brevissimis puberulis, oblique oblongo-lanceolata ad subrhomboideo-lanceolata breve mucronato-acuminata, 1-2 poll. longa, tenuiter et rigide coriacea, adulta glabra v. subglabra, v. secus costam puberula, subtus glaucescentia et secus nervos pubescentia; flores parvi, virescenti-albi, sessiles, in capitula pisi magnitudinis pedunculis gracillimis ½-1 pollicaribus puberulis instructa congregati et in racemos graciles puberulos axillares dein sæpius paniculam terminalem foliatam simulantes dispositi; calyx vix ½ lin. longus, pubescens; corolla usque ad calycis limbum lobata, extus pubescens, c. 1½ lin. longa; legumina non adsunt.—Martaban.

RUBIACEÆ.

154. PAEDERIA CALYCINA, nov. sp.

Herba volubilis, novellis puberulis; folia cordato-ovata ad cordato-lanceolata, petiolo 1-1½ pollicari puberulo suffulta, basi sinuato-cordata, acuminata, 2-3 pollicaria, integra, membranacea, utrinque præsertim subtus parce hispidula; flores ... superiores pedicellati, lateralibus sessilibus v. subsessilibus, in cymas dichotomas secundas parvas parce hirsutas disgesti, et paniculas thyrsoideas brachiatas hirsutulas axillares et terminales efformantes;

calyx indistincte puberulus, tubo c. \(\frac{1}{2} \) lin. longo v. longiore, lobis fere duplo longioribus, lanceolatis, subfoliaceis; corolla ...; capsulæ ovoideæ, c. 4 lin. longæ, compressæ, brunneæ et lucidæ, calycis limbo conspicuo coronatæ; semina capsulis conformia, alâ nigrescenti c. \(\frac{1}{2} \) lin. latâ circumdata.—Tenasserim (Wall. Cat. 6217 E).

Rubiacearum genera 44 in regno Burmanico occurrentia mihi cognita sunt, quorum conspectum hic addo:—

- Trib. I. STELLATAE. Calyx ovario omnino adnatus, v. limbo 4-6-fido. Corollæ lobi valvati, ovarium 2-loculare, ovulis in loculis solitariis erectis, adscendentibus v. raro pendulis. Drupa indehiscens, sicca v. succulenta. Semina exalata et libera, v. raro membrana alatim-expansa circumdata.—Stipulæ utplurimum in folia stipulacea transformata et foliis conformes v. subconformes, hine cum foliis verticillata, raro folia normaliter opposita.
 - § 1. Eustellatæ. Semina magis minusve globosa, libera, erecta v. adscendentia. Stipulæ foliaceæ evolutæ.
- 1. Rubia, L. Flores pentameri. Drupa succulenta. Herbæ annuæ v. perennes, erectæ v. scandentes.
- Galium, L. Flores 4-meri. Drupa utplurimum didyma, v. globosa, exsucca. Herbæ perennes v. annuæ, erectæ v. prostratæ.
- Trib. II. COFFEACEA: Drupa magis minusve carnosa v. succulenta, rarius bacca, 1-pluri-locularis, ovulis 1 v. pluribus in singulo loculo. Semina haud alata v. appendiculata. Stipulæ interpetiolares veræ connatæ v. liberæ.
- Subtrib. 1. Coffeeæ. Ovarium 2-loculare, ovulis in loculis solitariis erectis v. medio affixis. Bacca e pyrcnis 2 v. pluribus (raro abortu solitariis) tenuicrustaceis v. membranaceis monospermis composita.
 - § Ovarium 2-loculare.
 - * Corolla valvata. Albumen vulgo carnosum (Psychotrieæ).
- Cephaëlis L. (incl. Geophila, Don). Corolla infundibuliformis tubo longo.
 Calyx 4- v. 5-dentatus v.-lobatus. Flores capitati v. solitarii, axillares. Suffrutices v. herbæ perennes repentes.
- 4. Hydnophytum, Jack. Calycis limbus integer. Corollæ tubus brevis. Flores glomerati sessiles. Frutices epiphyti truncis tuberosis.
- Psychotria, L. Corollæ tubus brevis, fauce barbata. Pyrenæ facie interna .planæ et integræ. Flores cymosi v. cymosopaniculati. Frutices, raro suffrutices, raro scandentes.
- Chasalia, Comm. Corollæ tubus elongatus, fauce nudus. Pyrenæ facie
 interna secus placentam centralem excavatæ. Frutices v.
 suffrutices; inflorescentia precedentis.

- • Corollæ lobi imbricati v. contorti. Albumen vulgo osseum. (Ixoreæ.)
- Ixora, L. Corolla hypocraterimorpha, limbo 4-5-partito. Ovula medio affixa. Flores corymbosi v. paniculati. Stipulæ connatæ.
- 8. Coffea, L. Corolla infundibuliformis, glabra, limbo 4-7-partito. Baccæ
 2- raro 1-spermæ, semina pyrenis chartaceis inclusa. Flores
 terminales et axillares. Stipulæ liberæ. (Hic Prismatomeris, Thw.).
- 9. Serissa, Comm. (incl. Saprosma, Bl., Dysodidendron, Gardn.). Corolla infundibuliformis, velutina, sæpius unacum calyce subobliqua. Ovula erecta, basilaria. Baccæ 1- rarius 2-spermæ. Flores terminales et axillares. Stipulæ liberæ.

 § Ovarium 4-9-loculare. (Lasiantheæ).
- Lasianthus, Jack. Calyx magis minusve dentatus. Styli et ovarii loculi 4-9. Frutices erecti; flores glomerati v. cymosi, avillares.
- Gynochthodes, Bl. Calycis limbus truncatus. Stylus 2-fidus. Ovarium
 4-loculare. Frutices scandentes; flores glomerati, axillares.
- Subtrib. 2. VANGUERIEÆ. Ovarium 1- ∞-loculare, loculi 1-v. raro (in Polyphraginone) ∞-ovulati, ovulis lateraliter affixis v. a medio v. ex apice loculorum pendula. Pyrenæ duræ et osseæ, v. in putainen durum connatæ, v. liberæ et laxiuscule compactæ. Albumen vulgo carnosum.
 - § 1. Euvanguerieæ. Corolla valvata. Ovula lateraliter v. sub apice affixa.
- 12. Vangueria, Comm. Stigma discoideum. Ovarium utplurimum 5-loculare.
- Canthium, Lamk. Ovarium 2-loculare. Drupæ didymæ, v. abortu
 passim sub-1-loculares. (Hic Polyozus, Miq., non Lour.)
 § 2. Guettardeæ. Corolla imbricata.
 - Ovarium 2-loculare, ovulis in loculis singulis 2 placentæ centrali affixa. Drupæ elongatione placentæ spurie 4-loculares, loculis spuriis 1-spermis. Pyrenæ in putamen connatæ.
- Scyphiphora, Gærtn. Styli 2. Drupæ angulato-sulcatæ. Ovulum in loculo superiori spurio erectum, alterum in inferiori pendulum.
 - ** Ovarium 4-∞-loculare, ovulis in loculis solitariis pendulis. Pyrenæ in putamen ∞-loculare connatæ, loculis monospermis.

- 15. Guettarda, L. Stigma crassum, simplex. Drupæ globosæ, majusculæ.

 * * * Ovarium pluri-loculare, ovulis in loculis pluribus v. numerosis, secus placentas centrales superposita. Drupæ baccatæ, 5-10-loculares, loculi pyrenas spurias (seminibus testa crustaceo-indurată?) plurimas continentes.
- 16. Polyphragmon, Desf. Stigmata tot quot ovarii loculi.
- Subtrib. 3. Randeæ. Ovarium v. 1-loculare placentis parietalibus, v. smpius 2-∞-loculare, loculis ∞-ovulatis. Semina libera, nec pyrenis inclusa.
 - § 1. Gardenieæ. Ovarium 1-loculare, placentis 4-5 parietalibus. Corolla imbricata.
- Gardenia, L. Flores sæpius conspicui. Stigma integrum, sulcato-tortuosum. Bacca magna, ∞-sperma, seminibus in pulpa nidulantibus.
 - § 2. Eurandiez. Ovarium 2-loculare. Corolla imbricata.

 * Placenta simplex.
- Randia, L. Stigma bilobum; stylus fusiformi-incrassatus. Baccæ magnæ; semina in pulpo nidulantia. Arbores v. frutices erecti.
- Griffithia, WA. Stigma bilobum; stylus æqualis, haud incrassatus.
 Baccæ parvæ, haud pulposæ. Frutices scandentes sæpius armati.
- Webera, Schreb. Stigma simplex; stylus æqualis, filiformis. Baceæ parvæ, epulposæ. Arbores v. frutices erecti, inermes.
- Diplospora, DC. Stylus 2-fidus. Baccæ majusculæ, epulposæ. Scmina in loculis biseriata (an semper?). Arbores v. frutices erecti inermes. (An potius cum sequenti conjungendum?)
- IIypobathrum, Bl. Stylus 2-lobus. Baccæ parvæ, v. pedicellatæ, epulposæ. Semina in loculis uniseriata. Frutices erecti.
 (Hie Hyptianthera, WA., Petunga, DC. et probabiliter Scyphostachys, Thw., et Pristidia, Thw.).
 - * * Placentæ 2-fidæ. Stigma 2-5-lobum.
- Mussænda, L. Unus alterve calycis loborum florum exteriorum foliaceo-appendiculatus. Antherarum connectivum haud mucronatum.
- 24. Acranthera, Arn. Calycis deutes haud appendiculati, conformes. Antherarum connectivum mucronato-productum.
 - § 3. Urophylleæ. Ovarium vulgo 5-6- raro 2-3-loculare. Corolla valvata.

- Adenosacme, Wall. Calyx 5-4-fidus. Corollæ faux nuda. Cymæ v. corymbi terminales v. subterminales, raro laterales.
- Urophyllum, Jack. Calyx integer v. minute denticulatus. Corollæ faux barbata. Florum glomeruli v. cymæ axillares.
- Trib. III. CINCHONACEÆ. Capsula exsucca, vario modo dehiscens v. rarissime indehiscens [vel si carnescens uti in Sarcocephalo, v. baccata (uti in Morindeis) semina semper alata v. appendiculata].
 Ovarium 2- ω-loculare, loculis 1- ω-ovulatis. Semina alata, appendiculata, v. nuda. Stipulæ interpetiolares veræ.
- Subtrib. 1. Ovarii loculi 2-4, ∞-v. (in Cephalantho ? 1-) ovulati. Capsulæ vario modo dehiscentes. Semina plus minusve alata v. appendiculata.
 - § 1. Morindeæ. Flores dense capitati. Ovarium 2-v. œ-loculare, ovula solitaria et erecta v. numerosa et pendula. Baccæ v. drupæ baccatæ utplurimum in receptaculo incrassato congregatæ et sæpius in syncarpium connatæ.
 - Ovula et semina in loculis numerosa, imbricato-pendula.
- Psilobium, Jack. Bacca elongatæ, subfolliculares, discretæ. Arbores
 v. frutices.
 - * * Ovula et semina in loculis solitaria, erecta.
- 28. Morinda, L. Baccæ sæpius in syncarpium connatæ. Arbores v. frutices, nonnunquam scandentes.
 - § 2. Naucleeæ. Flores in receptaculo incrassato capitati.

 Capsulæ a basi v. alius modi dehiscentes, siccæ, v.
 raro (in Cephalantho) baccatæ.
 - * Capsulæ baccatæ, a basi dehiscentes.
- 29. Sarcocephalus, Afz. Capsulæ baccatæ 2-loculares, v. loculis 2 superpositis sterilibus auctæ, in syncarpium connatæ.
 - - Capsulæ in coccos 2- ∞-spermos dehiscentes.
 Corollæ et calycis lobi dentibus interjectis carentes.
- 30. Nauclea, L. Flores bracteolis carentes. Arbores, raro frutices erecti.
- Stephegyne, Korth. Flores bracteolis angulari-clavatis circumdati.
 Arbores.
 - OO. Capsulæ 2-4-loculares, loculis 1-ovulatis. Calycis et corollæ lobi in sinubus denticulati.

- 32. Cophalanthus, L. Flores 4-meri, bractcolis lineari-clavatis circumdati.
 Frutices v. arbusculæ.
 - OOO. Capsulæ 2-loculares, rimis longitudinalibus dehiscentes. Scandentes.
- 33. Uncaria, Schreb. Flores sessiles v. pedicellati, bracteolis destituti.
 - § 3. Eucinchoneæ. Flores paniculati v. corymbosi, haud capitati. Capsulæ 2-loculares, septicide in valvas 2 v. apice 4-valvatim dehiscentes.
 - * Capsulæ in valvas 2 lignosas septicide dehiscentes.
- Hymenodyction, Wall. Arbores; inflorescentiæ foliis floralibus discoloribus gaudentes.
 - * * Capsulæ apice 4-valvatim dehiscentes.
- Hymenopogon, Wall. Frutices epiphytici; inflorescentia foliis floralibus discoloribus gaudens.
- Subtrib. 2. Spermacoceæ. Ovarii loculi 2-4, loculis 1-v. pluri-ovulatis.

 Capsulæ vario modo dehiscentes v. in coccos 2-4 separantes, raro indehiscentes. Semina nunquam alata v. appendiculata, numerosa v. solitaria.
 - § 1. Hedyotide:e. Ovula et semina in loculis pluria v. numerosa, lateraliter affixa.
 - O Stipulæ connatæ v. liberæ, haud vaginantes v. setaceo-fimbriatæ. (Rondelctieæ).
 - * Stigma 2-fidum v. -lobum. Corolla imbricata v. tortuosa. Antherarum loculi mutici.
- Wendlandia, Bartl. Corolla tubulosa, tortuosa. Capsulæ apice bivalvatim dehiscentes. Arbores v. frutices. (Hic Greenia, WA.)
- Spiradiclis, Bl. Corollæ tubus brevis. Capsulæ in valvas 2 iterato bivalvatim separatas marginibus inflexas dehiscentes. Herbæ annuæ, erectæ.
- 38. Ophiorrhiza, L. Corolla infundibuliformis v. tubulosa. Placenta erecta, libera. Capsulæ compressæ, divaricato-2-lobæ, apice rima loculide-dchiscentes. Herbæ annuæ v. perennes.
 - * * Stigma capitatum. Corolla valvata. Antherarum loculi in appendicem sterilem setaceum prolongati.
- Argostema, Wall. Corolla subrotata, limbo 3-7-fido. Capsulæ apice valvis 4 dehiscentes. Herbæ Melastomacearum habitu.
 - OO Stipulæ petiolis adnatæ et basi vaginantes, setaceo-ciliatæ. (Euhedyotideæ.)
- 40. Dentella, Forst. Flores 5-meri, petala 2- v. 3-dentata. Capsulse vix dehiscentes.

- 41. Hedyotis, L. Flores 4-meri; petala integra. Capsulæ loculicide v. septicide dehiscentes, v. in coccos 2 v. 4 pleiospermos separantes.
 - Subg. 1. Oldenlandia. Capsulæ magis minusve hemisphericæ et obsolete 2-lobæ, loculicide dehiscentes.
 - Subg. 2. Dimetia. Capsulæ apice rima hiante brevi septicide dehiscentes, magis minusve truncato-hemisphericæ et obsolete 2-lobæ.
 - Subg. 3. Metabolos. Capsulæ septicide dehiscentes v. subdehiscentes, hemisphericæ, apice magis minusve truncatæ, sæpius obsolete 2-lobæ.
 - Subg. 4. Scleromitrion (Allæomorphia, Thw.). Capsulæ in coccos 2, v. eorum divisione, 4 indehiscentes pleiospermos separantes, calycis lobis convergentibus coronatæ. Calyx magis minusve ovoideus v. obovatus. An revera genus proprium? Spermacocis characteribus gaudens sed ovulis et seminibus plurimis discrepans et inter Hedyotidem et Spermacocem quasi intermedium.
 - § 2. Euspermacoceæ. Ovula et semina in loculis crecta et solitaria. Capsulæ dehiscentes, v. in coccos separantes, v. raro indehiscentes.
- Spermacoce, L. (incl. Hydrophylax, L. f.?) Ovula medio s. sub medio loculorum affixa. Capsulæ ab apice septicide dehiscentes. Herbæ annuæ v. perennes.
- 43. Knoxia, L. Ovula apice v. sub apice loculorum affixa. Capsulæ a basi in coccos 2 caducos separantes, axim persistentem setaceum relinquentes. Herbæ annuæ v. perennes.
 - § 3. Pæderieæ. Ovula et semina compressa in loculis pendula et solitaria. Capsulæ drupæformes, crustaceæ, v. pergamaceæ, vix dehiscentes, coccos 2 tenui-membranaceos alatim expansos includentes. An potius inter Coffcaceas recipiendæ?
- 44. *Pæderia*, L. Corolla valvata. Folia opposita v. 3-4-na verticillata. Volubiles.

COMBRETACEÆ.

155. TERMINALIA TOMENTELLA, nov. sp.

Arbor magna, novellis adpresse cupreo-pubescentibus; folia 5-8 poll. longa, petiolo 8-12 lin. longo apice biglandulose suffulta, basi inæquali decurrentia, ovata ad ovato-oblonga, acuta v. subacuta, coriacea, integra, junio-

ra subtus dense, adulta parce cupreo-pubescentia v. omnino glabrescentia; flores parvi, sessiles, spicati, paniculam parvam ferrugineo- v. fulvo-tomentellam componentes; bracteolæ subulatæ, floribus longiores, deciduæ; calycis lobi triangulares, acuti, extus glabri, intus unacum glandulis hypogynis albo-lanuginosi; tubus ovatus, teres, glaberrimus; drupæ poll. yix longæ, ovatæ, obsolete 5-gonæ v. teretes, lutescentes, læves.—Pegu, Martaban, Tenasserim. T. Chebulæ, Retz., quam maxime affinis, calycis tubo lævissimo, indumento copiosiore et fructibus minoribus distat.

BEGONIACEÆ.

156. BEGONIA NIVEA, Parish MS.

Herbula succulenta radice tuberosa?, subglabra; folia radicalia 1 v. 2, obovato-oblonga, apice irregulariter truncato-angulata, basi in petiolum brevissimum crassum glabrum constricta, dentata et parce setuloso-ciliata, palmatim 5-nervia, 2-3 poll. longa, membranacea, supra setulis brevibus adspersa, subtus glabra; scapus radicalis, glaberrimus, folio duplo longior, apice bibracteato, flores 2 v. 3 majusculos candidos gerens; bracteæ 2 ovales v. ovalioblongæ, acutæ, foliaceæ, c. 2-3-lin. longæ; flores feminei pedicellis brevioribus, masculi longioribus 1-1½ poll. longis glabris, instructi; sepala et petala obovato-oblonga ad lato-ovalia, c. 5 lin. longa, in femineis aliquanto breviora; stamina monadelpha; antheræ obovato-oblongæ, obtusæ; styli 2, basi v. ad medium fere connati, uno 3- altero 2-bifido et glandulis stigmaticis stipitatis dense obducti; capsulæ immaturæ glabræ, oblongo-ovatæ, inæquali-3-alatæ, alis triangularibus et acute productis, medio majore.—Tenasserim (Revd. Parish).

157. BEGONIA SUBPERFOLIATA, Parish MS.

Herbula erecta, succulenta, radice tuberosa? scapigera; folia radicalia solitaria, petiolo 1½ usque ad 3½ poll. longo subvelutino suffulta, ovata ad ovato-oblonga, vix inequalia, basi rotundata leviter peltata, obtusiuscule acuminata, grosse crenato-dentata, 2-3 poll. longa, membranacea, utrinque pulcherrime concavo-punctata (in vivo probabiliter papilloso-holosericea), subtus utplurimum subpurpurascentia; scapus radicalis v. subradicalis, glaber, folio brevior, dichotomo-cymosus, pauciflorus; bracteæ virides, ellipticolanceolatæ, acutæ, c. lin. longæ, papillosæ; flores parvi, rosei, pedicellis capillaribus glabris; sepala ovalia, obtusa, 2-3 lin. longa, extus conspicus venosa; stamina monadelpha; antheræ breves, obovatæ; styli 3, alte connati, 2-fidi; capsulæ c. 3 lin. longæ, obovatæ, glabræ, 3-loculares, 8-alatæ, alis capsulà ipså latioribus semi-obcordatis; placentæ 2-fidæ.—Tonasserim (Revd. Parish).

*158. BEGONIA VELUTINA, Parish MS.

Herbula simplex, scapifera, unifoliata, radice parva tuberosa; folium petiolo 1-8 poll. longo nonnunquam parce pubescente suffultum, cordato-ova-

tum ad cordato-rotundatum, palmatim 7-nerve, obtusum, v. breve et obtusiuscule acuminatum, irregulariter et breve lobatum, dentatum et ciliatum, c. 1-2
poll. longum et latum, membranaceum, supra papillosum et pilis minutis
brevibus adspersum, subtus secus nervos adpresse pubescens; scapi radicales,
folio vulgo sublongiores, glabri, pauciflori; bracteæ minutæ, lineares; flores
majusculi, rosei? scpala 4 lin. fere longa, lato-ovalia, obtusa; petala minuta,
lineari-lanceolata, acuminata; perianthii feminei lobi dimidio breviores; stamina numerosa, libera; antheræ obovatæ, breves, truncatæ; stigmata 3,
libera, apice dilatato in lobos stigmatiferos 2 tortuosos divergentia; capsulæ immaturæ obovatæ, glabræ, 3-loculares, anguste 3-alatæ alis apice
truncatis; placentæ bifidæ.— Tenasserim (Revd. Parish, Dr. Stoliczka).

Begoniæ species Burmanicæ sequenti modo distingui possunt:-

Subg. I. Casparea. DC. Capsulæ carnosæ et bacciformes, secus angulos v. alas crassas latas dehiscentes.

Herba robusta glabriuscula .ramosa; styli 4; capsulæ 4-loculares et 4-angulares, angulis in appendices cornutos productis, B. Roxburghii.

- Subg. II. Begonia, DC. Capsulæ siccæ, lineâ semicirculari secus lateres alarum v. angulorum dehiscentes.
- * Styli 2, bifidi v. vario modo dilatati v. ramosi ; capsulæ 2-loculares ; placentæ bifidæ.
- † Stamina libera. Capsulæ inæquali-3-alatæ, alis 2 anterioribus sæpius ad costam membranaceam reductis.

Herba robusta, ramosa, molliter paleaceo-pilosa; folia longipetiolata, lobata, B. laciniata.

- †† Stamina monadelpha. Maris perianthium 5-lobatum, femineum 5-6-lobatum; capsulæ inæquali-3-alatæ.
- || Folia et inflorescentia radicalis, illa in petiolum 2-3 lin. longum contracta, ciliata, supra hispida; flores poll. fere in diametro, candidi,... B. nivea.
- || || Inflorescentia axillaris v. o basi folii orta, v. prolifica e gemma axillari.
- O Non prolifica. Folia alterna v. verticillata, raro numero ad solitarium reducta. Flores parvi, albi.

Planta Burmanica, floribus roseis gaudens, ab Assamica paullo differt capsulis majoribus crassioribus magis pilosis.

OO. Prolifica, folio solitario radicali v. foliis paucis alternatis. Flores parvi, albi.

† † † Stamina monadelpha; perianthium utriusque sexus 2-sepalum, apetalum.

- * * Styli 3, liberi v. connati ; capsulæ 3-loculares et 3-alatæ.
- † Placentæ integræ.

- ++ Placentæ bifidæ.
- O Herbæ caulescentes foliis caulinis alternatis.

Uti pracedens, sed folia opaca et pilosiora; stamina monadelpha, anthera connectivo truncato lato terminata; styli ad medium connati, B. scutata.

OO. Herbæ scapigeræ, foliis et inflorescentiis radicalibus et vulgo solitariis.

ERICACEÆ.

159. VACCINIUM VERTICILLATUM, Kurz, non Wight. (Agapetes verticillata, D. Don, Gen. Syst. III. 862.; DC. Prod. VII. 554).

Frutex epiphyticus, 2-3 pedalis, glaber; folia obovato-lanceolata ad subcunesto-lanceolata, petiolo brevissimo crassissimo, v. subsessilia, basi attenuata rotundata v. obtusa, 2½-3½ poll. longa, obtusiuscula v. breviter acuminata, coriacea, integra v. apicem versus obsolete et remote serrata, glabra, nervis

secus marginem anastomozantibus; flores speciosi, coccinei v. miniati, tubulosi, ad 1½ poll. longi, pedicellis subpollicaribus, glanduloso-hirsutis suffulti, umbellam v. potius racemum abbreviatum pauciflorum axillarem formantes v. solitarii v. fasciculati; calyx 5-dentatus, glanduloso-hirsutus, dentibus lanceolatis acutis lin. circiter longis; corolla glabra, 5-gona, lobis hearilanceolatis obtusis; filamenta 2 lin. fere longa; antheræ c. 3 lin. longæ, granulato-tuberculatæ, in tubos rigidos plus quam poll. longos productæ; stigma parvum, truncatum v. sub-5-lobo-peltatum; baccæ glanduloso-hirsutæ, pedunculi apice subcyathiformi-incrassato insidentes, calycis limbo coronatæ.

Var. a. genuinum, corolla 3 poll. tantum longa; flores in racemos umbelliformes brevipedunculatos dispositi. (Thibaudia obliqua, Griff., Icon. Dicot. t. 515).

 $Var. \ \beta. \ elegans$, corolla præcedentis sed flores solitarii v. 2-3-ni fasciculati axillares; folia vulgo latiora.—Pequ.

? Var γ . grandiflorum, corolla duplo longior, flores in racemos umbelliformes breve pedunculatos v. sessiles collecti, rarius solitarii.—Martaban, Tenasserim.

N. B.—V. verticillatum, Wight, Ic. t. 1181. ad V. setigerum (Agapetes setigera, Don) pertinct.

160. VACCINIUM VARIEGATUM (Agapetes variegata, Don, Gen. Syst. III. 862; Ceratostemma variegatum, Road. Fl. Ind. II. 413; Griff. Icon. Dicot. t. 502; Thibaudia variegata, Royle, Ill. Ilim. Pl. t. 79, f. 1.).

Frutex epiphyticus, 2-3 pedalis, glaber; folia lanceolata ad obovato-lanceolata, acuta v. breviter acuminata, petiolis brevissimis crassis, v. subsessilia, basi acuta v. obtusa, 2-3 poll. longa, coriacca, apicum versus obsolete repando-serrata, glabra, nervis secus marginem anastomozantibus; flores coccinei, pedicellis gracilibus glabris sursum cyathiformi-incrassatis suffulti, in racemos umbelliformes axillares v. supra foliorum delapsorum cicatricibus ortos pedunculatos glabros dispositi, v. rarius fasciculati v. solitarii; corolla glabra, poll. fere longa, tubulosa, lobis obtusiusculis; calyx glaber, 5-fidus, lobis oblongis lanceolatis c. 2 lin. longis acutis sæpius obsolete costatis et penninerviis; antheræ granulato-tuberculatæ, filamentis brevissimis suffultæ, in tubos \frac{1}{2}-\frac{1}{2}\$ poll. longos productæ; stigma truncatum; baccæ glabræ, rubræ, calycis limbo coronatæ.

Variat: a. macranthum (Ceratostemma variegatum, Roxb. et Wight; Thibaudia macrantha, Hook., Bot. Mag. t. 4566.) flores c. 2 poll. longi v. longiores, variegati.— Tenasserim.

Var. B. parviflora (Thibaudia variegata, Royle) flores dimidio minores, ministi v. coccinei.—Martaban.

161. VACCINIUM MINIATUM (Ceratostema miniatum, Griff. Icon Dicot. t. 504.)

v. acuminata, petiolis brevissimis crassis, v. subsessilia, basi subinæquali rotumiata, petiolis brevissimis crassis, v. subsessilia, basi subinæquali rotumiata, 4-5 poll. longa, acuta v. acuminata, repando-serrulata, coriacea, glabra, subtus nervis numerosis et prominentibus, secus margines evanescentibus, laxe et prominenter reticulata; flores coccinei, racemos breves umbelliformes glabros axillares v. laterales efficientes, raro pauci et fasciculati; calyx glaber; corolla glabra, 5-gona, c. 3 poll. longa, lobis brevibus linearibus acutis; filamenta brevissima, antheræ tubo inclusæ, granulato-tuberculatæ, tubis strictis nudis paullulo breviores; baccæ desunt.—Ava? (Griff.)

162. VACCINIUM CAMPANULATUM, nov. sp.

Frutex epiphyticus, glaber, ramulis subangulatis; folia obovato-oblonga ad lanccolata, obtusa v. obtusiuscule acuminata cum mucrone, petiolis brevissimis et crassis v. subsessilia, 2-3 poll. longa, basi acuta v. obtusa, integra v. subintegra, marginibus recurvis, coriacca, glabra, nervis tenuibus secus marginem liberis, laxe reticulata; flores coccinci, sæpius variegati, pedicellis gracilibus glabris suffulti, in racemum gracilem sed brevem glabrum sæpius e ramis ortum dispositi; calyx glaber, limbo cyathiformi argute sinuato-5-dentato; corolla glabra, c. ½ poll. longa, v. paullo longior, 5-angularis, campanulata, lobis longis lanccolatis acuminatis reflexis; filamenta brevissima; antheræ granulato-tuberculatæ, loculis in tubos strictos anthera ipsa sublongiores dorso basi refracto-setosos terminatis.—Martaban.

163. VACCINIUM MACROSTEMON, nov. sp.

Frutex epiphyticus, 2-4 pedalis, glaber; folia cum basi crassa rotundata v. obtusa subsessilia, obovato-lanceolata ad lanceolata, acuminata, 3-5 poll. longa, marginibus integris recurva, coriacea, glabra, nervis tenuibus marginem versus liberis, tenuiter et laxe reticulata; flores coccinei, pedicellis gracilibus glabris in racemos magis minusve elongatos glabros subulato-bracteatos solitarie v. geninatin supra foliorum delapsorum axillis ortos dispositi; calyx glaber, limbo cyathiformi, lobis longe subulatis; corolla c. 1½ poll. longa, glabra, subcurvo-tubulosa, lobis·lineari-lanceolatis reflexis; filamenta glabra, gracilia, c. ½ poll. longa v. longiora; antheræ breviusculæ, connatæ, læves, loculis in tubos strictos anthera longiores productis; baccæ fusiformiovoideæ, apice angustatæ et calycis limbo cyathiformi coronatæ.—Martaban.

164. VACCINIUM PUMILUM, nov. sp.

Frutex ramosissimus, parvus, epiphyticus, novellis pubescentibus; folia oblonga ad lanceolato-oblonga, petiolo brevissimo puberulo, basi acuta, obtusiuscula, crenulata, crasso coriacea, c. poll. longa v. breviora, subtus (in vivo albidi) pallida, nervis obsoletis; flores parvi, pedicellis brevissimis pube-

rulis, in racemos (2 v. 1) terminales pubescentes bracteatos disgesti; bracteæ deciduæ, albæ, membranaceæ, foliaceæ, ovatæ, puberulæ et ciliatæ; calyx pubescens, dentibus oblongo-lanceolatis, acutis, ciliatis; corolla c. 2 lin. longa, oblongo-urceolata, lobis brevissimis reflexis, 5-gona, extus glabra, intus inprimis ad faucem dense villosa, rosea; filamenta brevia, filiformia pice pilosa et barbata; antheræ glabræ, loculis in tubum brevem lanceolatosubulatum basi bisetosum desinentibus; baccæ parvæ, purpureæ, glabræ, calycis limbo coronatæ.—Martaban.

165 VACCINIUM EXARISTATUM, nov. sp.

Frutex magnus, sæpius in arbusculam excrescens, novellis pubescentibus; folia oblongo-lanceolata ad oblongo-ovata, petiolis puberulis brevibus suffulta, basi acuta v. obtusiuscula, 1½-2½ poll. longa, acuta v. breve acuminata, subtus dum juvenilia parce pubescentia, glabrescentia, chartacca, serrulata, penninervia et inconspicue reticulata; flores albi, pedicellis 1-1½ lin. longis puberulis, racemum secundum gracilem puberulum axillarem formantes; bracteæ coccineæ, deciduæ; calyx puberulus v. subglaber, lobis triangulari-acutis, corolla 2-2½ lin. longa, glabra, urceolata, lobis reflexis brevibus; filamenta pilosa, basi dilatata; antheræ tubis brevibus et setis destitutis terminatæ; baccæ globosæ, glabræ, rubræ, calycis limbo coronatæ.—Martaban.

Var. a. semipubescens, calyx glaber v. subglaber.

Var. β. pubescens, calyx pubescens.

PRIMULACEÆ.

166. Lysimachia linearifolia, Griff., MS. in Hb. Griff. 3532.

Herba annua, crecta, stricta, glabra, caulibus teretibus v. subteretibus simplicibus ped. circiter altis; folia alterna, linearia ad lineari-lanceolata, utrinque acuminata, 1-1½ poll. longa, petiolo gracillimo sed brevi suffulta, integra, membranacea, glabra; flores parvi, solitarii v. geminati, axillares, longe pedunculati; calycis segmenta lineari-subulata, plus quam lineam longa; pedunculi fructigeri graciles, c. 1½ poll. longi.—Ava? (Griff.). L. pedunculari, Wall., affinis. Lysimachiae sp. Griff. Not. Dicot. 299. t. 484, speciem mihi distinctam L. Lobelioidi affinem nomine L. Griffithianæ saluto.

MYRSINEACEÆ.

167. ARDISIA HELFERIANA, nov. sp.

Frutex? ferrugineo-tomentosus; folia obovato-oblonga ad oblonga, petiolis 3-4 lin. longis crassis dense ferrugineo-pubescentibus, breve acuminata, integra v. obsolete repando-dentata, 3-5 poll. longa, membranacea, utrinque ferrugineo-pubescentia, nervis lateralibus tenuibus et curvis; flores parvius-euli, pedicellis 1-1 poll. fere longis ferrugineo-pilosis sustenti, racemum sub-umbelliformem ferrugineo-pubescentem pedunculo nudo 3-1 pollicari gracili

axillari suffulto formantes; calyx ferrugineo-pilosus, lobis oblongo-lanceolatis, acutis, lineam circiter longis; corolla glabra, lobis c. 2½ lin. longis, oblongis, acutis; drupæ desunt.—Tenasserim (Helf. 3589).

168. ARDISIA SERRULATA, nov. sp.

Frutex? novellis tomento minuto ferrugineo obtectis; folia lanceolata v. elliptico-lanceolata, basi in petiolum 5-8 lin. longum attenuata, breve acuminata v. acuta, repando-serrulata, basin versus integra, 4-6 poll. longa, tenuia et membranacea, glabra, parce punctata, nervis crebris approximatis, subparallele-divergentibus et inconspicuis; flores parvi, pedicellis gracilibus inæquali-longis ferrugineo-puberulis suffulti, densiuscule thyrsoideo racemosi et paniculam terminalem v. ex axillis foliorum superiorum ortam amplam ferrugineo-puberulam bracteatam formantes; bracteæ foliaceæ, linearilanceolatæ, 3-6 lin. longæ, subtus ferrugineo-lepidosæ; bracteolæ minores, lineares; calyx ferrugineo-puberulus, lobis linearibus acutis c. 1 lin. longis; corolla subrotata, lobis ovatis acutis c. 2 lin. longis; drupæ desunt.—Ava? (Griff. 3562). Inter A. neriifoliam et A. floribundam, Wall., intermedia.

169. ARDISIA RIGIDA, nov. sp.

Frutex? novellis probabiliter indistincte ferrugineo-lepidotis; folia oblogo-lanccolata, in petiolum 4-6 lin. longum crassum attenuata, breve et obtusiuscule acuminata, pergamacea, integra, 6-9 poll. longa, glabra, punctata, nervis subtus prominentibus et subparallelis; flores...parvi, pedicellis lilin. longis crassis minute ferrugineo-puberulis nutantibus suffulti, panieulam terminalem compositam rigidam robustam ferrugineo-puberulam efficientes; calyx minute et indistincte puberulus, lobis ovatis acutiusculis, vix lin. longis, ciliolatis; corolla...; drupæ immaturæ globosæ, glabræ.— Tenasserim or Andumans. (Helf. 3563).

170. MÆSA MUSCOSA, nov. sp.

Frutex ramis teretibus lævibus nitidisque, ramulis..; folia oblonga ad obovato-oblonga, basi acuta v. acuminata, petiolis ½-1 poll. longis validis parce puberulis, breve acuminata, grosse sinuato-dentata, pergamacea, 5-7 poll. longa, glabra, co-ta subtus parce puberula, nervis secus margines in denticula callosa obtusa excurrentibus; flores minuti, 5-meri, pedicellis brevissimis pubescentibus suffulti, breve racemosi, in paniculam axillarem quasi muscosam petiolis 2-3-pl. longiorem ferrugineo-pubescentem disgesti; bracteæ lin. circiter longæ, pedicellis longiores, ferrugineo-hirsutulæ, lineari-acuminatæ; bracteolæ?; calyx ferrugineo-hirsutus, lin. fere longus, lobis ovato-lanceolatis acutis; corolla tubuloso-campanulata, glabra, calyce duplo longior, lobis brevibus rotundatis; ovarium sub-inferior; stylus calycis lobos longitudine haud attingens.—Burma (Griff. 3556). Ex affinitate M. mollicei

mo. M. permollis, species olim a me in hocce diario descripta (cf. 1871, p. 66) nunc formam extremam latifoliam M. mollissimo, Wall., habeo. Formas intermedias inter ambas species nuper in Burmania haud raro observavi.

SAPOTACEÆ.

171. ISONANDRA CALOPHYLLA, Kurz, in Journ. As. Soc. Beng. 187—3.

Arbor mediocris, novellis dense adpresse ferrugineo-pubescentibus; folia elliptica v. elliptico-oblonga, petiolis 4-5 lin. longis cupreo-puberulis glabrescentibus, breve acuminata, integra, marginibus recurvulis, 4-7 poll. longa, chartacea, minute ferrugineo- v. cupreo-sericea glabrescentia, supra nitida, nervis lateralibus prominentibus validis, transverse tenui-venosa; flores nondum reperti; fructus pruni magnitudinis, pedunculo nutante, 1-1; pollicari subglabro axillari sustenti, elliptico-ovati, apiculati, dense ferrugineo-puberuli, 1-2-spermi, basi calyce persistente 6-partito lobis ovatis supportati; semina semi-oblonga, 1; poll. fere longa, lucida, brunnea.—Andamans.

EBENACEÆ.

172. GUNISANTHUS MOLLIS, nov. sp.

Arbuscula ramis novellisque brunneo-pubescentibus; folia petiolo brevissimo (c. 1 lin.) suffulta, anguste oblonga v. oblongo-lanceolata et sapius basin obtusam versus subangustata, obtusiuscule acuminata, 3-4 poll. longa, chartacea, supra secus costam et subtus omnino molliter pubescentia; flores ochracei, extus dense pubescentes, pedicellis 4-6 lin. longis pilosis suffulti, racemos breviusculos pilosos eflicientes; calycis lobi lineari-lanceolati, c. 3 lin. longi, tubo multo breviores; corollæ lobi tubo calycino paullulo longiores, feminei fructusque adhuc ignoti. Diospyros mollis, Kurz MS. olim.— Martaban.

173. DIOSPYROS SAPOTOIDES, nov. sp.

Arbor mediocris, novellis parce ferrugineo-pubescentibus mox glabrescentibus; folia elliptico-oblonga ad elliptica, basi obtusa, petiolo vix semipollicari glabrescente crasso suffulta, 6-8 poll. longa, breve et obtusiuscule acuminata, integra, coriacca, reticulatione laxissima subtili et immersa percursa; flores hermaphrodito-feminci 4-meri, flavescenti albi, iis D. sapota assimiles, subsessiles, glomerati, pedunculo crassissimo axillari brevissimo; calyx extus ferrugineo-pubescens, lobi ovato-lanceolati marginibus reflexi et basi auriculato-complicati, 3 lin. fere longi, acuminati; corollæ tubus urceolatus, calyce sub-duplo longior, extus ferrugineo-pubescens, lobis obovatis tubi fere longitudinis; stamina c. 12, tubo basi inserta, glabra, insequalia; antheræ ovato-lanceolatæ, acuminatæ; filamenta filiformia, glabra; ovarium ovatum, glaberrimum, stylo moderate longo 4-fido; flores masculi fructusque desunt.—Pegu.—D. undulatæ arcte affinis, sed ovario glaberrimo discrepat.

abdominal segments, and on the lower side the first segment is centrally grooved; neither of these characters are mentioned by Lucas, though when describing the respective parts he could hardly have overlooked these prominent characters. I consider Koch's rufipes as the same which he describes under the name of proscorpio; for the differences which he notices as distinguishing the two are decidedly of no specific value.

In the second group with two denticles on the second joint of the cheliceres, Butler describes *T. formosus*. My specimen of evidently the same species has six denticles of which, however, only two are well marked.

In the third division, including species with six well developed denticles, one is referred to under the old name of *T. caudatus*. I shall attempt to trace the history of this name when speaking of *T. indicus*, (n. sp.), which is possibly the same species as the one referred to by Butler from Madras and Bengal under the name of *T. caudatus*.

In addition to the three sections, I have one species, T. Beddomei, from the Anamallies, with seven denticles on the upper edge of the second joint. Among the very large number of specimens of T. scabrinus, (n. sp.), I found instances in which the second left joint has occasionally six denticles, while the right one had constantly only five. This clearly shews that the sections solely based upon the character, selected by Mr. Butler, can have only a very limited use.

Thus far I have commented upon Mr. Butler's determinations, but it must be understood that in the above instances my observations are mainly based upon descriptions and figures; for I have no other but Indian specimens for comparison. If those descriptions and figures were found to be incorrect, or not reliable, the mistakes had first to be pointed out and corrected, before a determination, based upon them, was admitted or rejected.

Finally, before entering upon the specific details, I must briefly allude to the geographical distribution of the genus. This distribution extends from South America and the West Indies northwards to Mexico, in a westerly direction through the ocean of little islands to the Philippines, touching North Australia, and stretching North as far as Corea, China and through the Malay Peniusula to Burma and India, where we meet with most of the species in the provinces of Assam and Sikkim, more rarely in Bengal and in South India, including Ceylon, all countries which have a marked admixture of Malayan types. No species is known to occur westward of the country alluded to, not even in Eastern Africa, as far as we know at present. This distribution resembles in so many respects that of the Passalide, that I shall again return to its discussion at an early opportunity.

lia, breve acuminata, 3-5-poll. longa, integra, membranacea, glabra, subtus pallida; flores pedicellis 1-1½ lin. longis suffulti, cymas 3, v. raro 2, v. plures breve pedunculatas, v. nonnunquam subsessiles, glabras paucifloras in ramulorum superiorum furcationibus sitas efformantes; calyx glaber, brevissimus, 5-fidus, segmentis lineam vix longis, lanceolatis, acutis; corollæ tubus subcrassus, c. 4 lin. longus, apice inflatus, lobis tubo vix dimidio brevioribus; folliculi... .—Martaban. T. rostratæ, Wall., affinis videtur, a qua inter alia corolla duplo breviore differt.

178. TABERNÆMONTANA MEMBRANIFOLIA, nov. sp.

Frutex 3-4 pedalis, glaber; folia lanceolata ad lato-lanceolata, in petiolum 3-5 lin. longum attenuata, 3-5 poll. longa, longe et graciliter acuminata, integra, membranacea, glabra, subconcolora; flores albi, pedicellis gracilibus 4-6 lin. longis glabris inserti; cymæ vulgo binæ, breve pedunculatæ, dichotomo-ramosæ, glabræ, laxæ, corymbiformes in ramulorum superiorum furcationibus sitæ; bracteæ nullæ v. minutæ et deciduæ; calyx minutus, lobis lineari-subulatis, lineam vix longus; corollæ tubus gracilis? poll. longus, infra medio circa antheras leviter inflatus, lobi lineari-lanceolati, acuminati, tubo dimidio circiter breviores; folliculi desunt.—Martaban. T. subcapitatæ, Wall., affinis, sed calyce jam distincta.

BIGNONIACEÆ.

179. SPATHODEA VELUTINA, nov. sp.

Arbor, novellis fulvo-puberulis; folia impari-pinnata, 1-1½ ped. longa, petiolo glabro striato basin versus 1-2 foliolis diminutis stipuliformibus munita; foliola 4-juga cum impari longe petiolato, basi inequalia, sessilia v. subsessilia, oblongo-lanceolata, acuminata, 4-6 poll. longa, serrulata, membranacea, glaberrima; inflorescentia deest; calyx spathaceus, recurvato-acuminatus, extus fulvescenti-velutinus, c. 1½ poll. longus; corolla c. 3 pollicaris, campanulato-infundibuliformis, glabra, tubo pollicari constricte, filamenta glabra, tubo supra constrictione inserta; capsula deest.—Ava, Pegu (Dr. Brandis).

180. HETEROPHRAGMA SULFUREA, nov. sp.

Arbor mediocris decidua, novellis tomento fugaceo canescenti-villoso obductis; folia impari-pinnata, 2-3 ped. longa, rachi petioloque fugaciter floccoso-tomentoso; foliola 4-5-juga cum impari longe petiolato, elliptica et ovato-elliptica ad ovalia, juniora obtusiuscule apiculata v. obtusiuscula et obsolete serrata, basi rotundata v. obtusa, sessilia v. brevissime petiolulata, 4-6 poll. longa v. longiora, chartacea, parce puberula, supra mox glabrescentia; flores sulfurei, conspicui, pedicellis cinerascenti- v. flavescenti-tomentosis 3-4 lin. longis suffulti, paniculas breves terminales dense tomentosas efficientes; calyx \(\frac{1}{2}\)-\(\frac{3}{2}\) poll. longus v. brevior, campanulatus, usque ad medium fissus,

distincte 3- v. 2-lobatus v. dentatus, extus cinerascenti-tomentosus, intus glaber; corolla infun.libuliformis, glaberrima, tubo pollicari v. longiori, lobi patentes tubo plus quam duplo longiores, undulato-crispati; capsulæ usque 2 pedales, iis Spathodeæ stipulatæ assimiles, elongato-lineari-oblongæ, compressiusculæ, dense fumoso-tomentosæ, septo brevi et valde reducto, medio septe instar dilatato; semina elongato-membranaceo-alata, c. 2 poll. longa.—
Prome, Pegu.

181. Spathodea ignea, Kurz, in Journ. As. Soc. Beng. vol. XL, p. 77 descripta, potius generis novi typum praebet. calyce tantem usque ad medium fisso circumscisse deciduo spathaceo, filamentis usque ad medium corollæ adnatis, antherarum loculis parallelis, nec non foliis decompositis a Spathodea distingui potest et sub nomine Mayodendri (in honorem viri nobilissimi Mayo, proregis infausti Indiæ orientalis, dictum) in narratione mea officiale de sylvis Burmanicis fusius descripsi et iconibus illustravi.

182. STEREOSPERMUM NEURANTHUM, nov. sp.

Arbor mediocris, novellis molliter pubescentibus; folia impari-pinnata, juniora præsertim subtus pubescentia, 1-1\(\frac{1}{2}\) ped. longa; foliola 3 v. 2-juga eum impari longe petiolato, basi subinæquali acuta v. obtusa, petiolulo crasso 1-2 lin. longo suffulta, obtusiuscula v. obtusiuscule apiculata, 2-4, nonnuquam usque ad 5-6, poll. longa, integra, rigide chartacea, juniora subtus canescenti-tomentosa denuo magis minusve scabrescentia, supra scabrescentia glabrescentia et subrugulosa; flores conspicui, pallide lilacini v. cyanescentialbi, atropurpurco-venosi, pedicellis 4-7 lin. longis pubescentibus apicem versus bibracteolatis, in paniculam breviusculam subcymiformem pubescentem terminalem dispositi; calyx c. 4 lin. longus, pubescens, breviter 4-lobus; corolla campanulato-infundibuliformis, subcurva, puberula, lobis leviter undulato-crispatis; capsulæ clongato-lineares, cylindrico-4-gonæ, glabræ, 1-1\(\frac{1}{2}\) ped. longæ; semina et septum uti in S. chelonioide.—Pegu.

ACANTHACEÆ.

183. RUELLIA FLACCIDA, nov. sp.

Herba debilis, pilosa, ramosa et suberecta, 1½-2 pedalis, caulibus longe et patenter pilosis; folia ovata, basi contracta et in petiolum gracilem pilosum ½-1 poll. longum attenuata, obtusa, 1½-2 poll. longa, membranacea, obsolete crenato-dentata, præsertim supra parce pilosa; flores parviusculi, pallide cœrulei, inter bracteas foliaceas obovato-oblongas obtusas v. emarginatas pilosas fimbriatas vulgo solitarii et sessiles; calyx 3 lin. fere longus, lobis linearibus, ciliatis et pilosis; corolla c. 6 lin. longa, tubuloso-infundibuliformis, glabra, tubo breviusculo, lobis brevibus rotundatis; stamina 4, filamenta longe pilosa; stylus simplex, 6 lin. fere longus, glaber; ovarium glabrum.—Pegu.

184. RUELLIA MACROSIFHON, nov. sp. (R. sp. T. And. in Linn. Proc. IX. 461 in nota).

Herba perennis? subsimplex, 2-3 pollicaris, caulibus hirsutis, novellis pilis albis crispis sublanuginosis; folia lineari-lanceolata v. linearia, c. 2 poll. longa, acuminata, in petiolum brevissimum attenuata, integra, membranacea, ciliata, utrinque præsertim secus nervos hirsutula; flores magni, solitarii, sossiles, bracteis 2 foliaceis pedunculum brevem axillarem terminantibus insidentes; bracteæ lineari-lanceolatæ, calyce pluries longiores, structura et indumento foliis similes; calycis segmenta lineari-subulata, c. 2½ poll. longa, minute puberula; corolla tubuloso-infundibuliformis, c. 2 poll. longa, extus parce pilosula, lobis magnis rotundatis, tubo pollicari gracili in corollæ partem efflatam sensim ampliato; stylus longissimus, parce hirsutus; stamina 4, subæquilonga, inclusa; filamenta gracilia, parce hirsuta.—Prome? (Col. Eyre). R. suffruticosæ, Roxb., arcte affinis.

185. STROBILANTHES (HEMIGRAPHIS) BURMANICA, nov. sp.

Herba decumbens ramosissima pilis albis patentibus cum glanduliferis intermixtis vestita, cauli ramisque 4-gonis; folia ovata ad ovato-lanceolata, basi in petiolum ½-2 poll. longum pilosum angustata, obtusiuscula, 1½-2 poll. longa, membranacea, crenato-dentata, utrinque parce pilosa; flores pallide cyanei, passim solitarii et axillares, frequentius autem in spicas longiores v. breviores foliaceo-bracteatas pilosas pedunculatas axillares et terminales disgesti; bracteæ ovato-lanceolatæ, obtusiusculæ, integræ, parce pilosæ et longo ciliatæ, inferiores usque ad 7 lin. longæ; bracteolæ nullæ; calyx pilosus, segmentis linearibus 4 lin. longæ; corolla rugata, 6 lin. circiter longa, glabra, ore pubescens, sensim in tubum attenuata, lobis obtusis rotundatis; antheræ 2-loculares, pallide violaceæ; filamenta crassa, piloso-barbata; stylus inæquali-2-fidus; capsulæ 4 lin. longæ, compresso-4-gonæ, obovato-lineares, acutæ, glabræ, a basi fere 8-spermæ; semina plus quam ½ lin. in diametro, anguste marginata.—Ava, Prone, Pegu. S. (Hemigraphish) Pavalæ, quacum cl. T. Anderson confudit, affinis.

186. STROBILANTHES (HEMIGRAPHIS) GLANDULOSA (Hemigraphis glandulosa, T. And. MS. in Kurz, And. Rep. App. B. 13.)

Herba ramosa, glanduloso-puberula; folia lanceolata v. oblongo-lanceo-lata, obtusiuscule acuminata, in petiolum glandulosum brevem attenuata, 2-2\frac{1}{2} poll. longa (superiora minora) repando-dentata, præsertim subtus secus costam glanduloso-puberula, supra glabrescentia; flores parviusculi, pulchre lutei, in axillis bractearum foliacearum vulgo solitarii, spicas 1 v. 2 axillares et terminales interruptas longe-pedunculatas foliaceo-bracteatas efformantes; bracteæ foliis caulinis similes sed multo minores, obtuaæ, superiores sensim minores; bracteolæ calyce breviores, obovato-oblongæ, viscoso-hirsutæ; calycis segmenta lineari-spatulata, obtusa, glanduloso-hirta, c. 2\frac{1}{2}

lin. longa; corollà c. 3. lin. longa, campanulato-infundibuliformis, tubo brevi extus puberulo intus lævi, lobis rotundatis; stylus et filamenta glabra; capsulæ clavatæ, compressiuscule-4-gonæ, calycis longitudine v. paullo longiores, apiculatæ, glanduloso-puberulæ, abortu vulgo 2-3-spermæ.—Andamans. Ex affinitate S. (Hemigraphis) Griffithianæ.

187. STROBILANTHES NEESII, nov. sp.

Frutex magnus, 10-12 pedalis, ramulis puberulis glabrescentibus; folia lanceolata ad oblongo-lanceolata, breve acuminata, in petiolum 1-11 poll. longum attenuata, obsolete repando-dentata, 5-7 et sepius, usque ad 10 poll. longa, membranacea, utrinque pilis minutis adpressis adspersa, subtus secus costam puberula; flores majusculi, in spicas densas bracteatas sessiles denuo elongatas laxas interruptas axillares et terminales dispositi ; bractem inferiores v. potius folia floralia foliaceæ, valde caducæ, c. 🛊 poll. longæ v. lon🛥 giores, setis brunneis ciliatæ, apicem versus fissæ et serratæ; bracteæ veræ oblongo-lineares, calyce breviores, apicem versus vulgo parce serratæ, acuminatissimæ, glanduloso-pilosæ; bracteolæ 2, calycis longitudine, lineari-lanceolatæ, acuminatæ, basi attenuatæ, glanduloso-hirsutæ; calycis segmenta c. 6 lin. longa, v. longiora, linearia, canescentia, ciliata, acumen versus sæpius glanduloso-hirsuta; corolla 11-11 poll. longa, purpurea, extus glabra, intus fauce secus plicam duplicatam pubescens, tubo longo et gracili; stamina 2 (?); filamenta glabra, filiformia, alte adnata; stylus hirsutus; capsulæ lineari-clavatæ, calyce paullo longiores, glabræ, acumine parce hirtulæ, 4-spermæ; semina sericea.—Martaban. S. fimbriatæ, N. E., maxime affinis, sed indumento glanduloso nigrescente, corolla et filamentis glabris differt.

188. STEOBILANTHES FŒTIDISSIMA, nov. sp.

Herba ramosa, caulibus divaricatis subteretibus, plus minusve dense fulvo-pilosa; folia ovata, basi in petiolum longum gracilem fulvescenti-pilosum attenuata, acuminata, membranacea, 8-5 poll. longa, serrato-dentata, utrinque albido v. ochrascenti-hirsuta; flores cyanei, conspicui, spicam laxiusculam brevem albido-pubescentem pedunculo brevi axillari dense fulvescenti-hirsuto suffultam v. subsessilem efformantes; bracteæ obovato-cuneatæ, c. 8 lin. longæ, obtusæ, herbaceæ, glanduloso-hirsutæ; bracteolæ bracteis conformes sed angustiores et subbreviores; calyx bractearum longitudine, adpresse glanduloso-puberulus, segmentis profunde lobulatis; corolla 1½ poll. fere longa, glabra; filamenta glabra; stylus hirsutus; capsulæ c. 8 lin. longæ, glaberrimæ; semina fere 2 lin. in diametro, adpresse villosa.—Martaban. S. rufescenti affinis.

189. STROBILANTHES PTEROCAULIS, nov. sp.

Herba annua, robusta, erecta, ramosa, sparse hirsuta, caulibus crassiusculis quadrangulari-alatis, alis herbaceis dense fimbriatis; folia 8-12 poll. longa, obovato-oblonga, basi angustato-cuneata ciliata in petiolum crassum brevissimum (2-8 lin.) decurrentia, breve acuminata, crenato-dentata, membranacea, utrinque plus minusve hirsuta; flores parvi, flavescentes, spicas breves dense bracteatas glandulosas 3-4-nas in paniculam axillarem dispositi; pedunculi et ramificationes acute 4-angulati, anguste alati, et dense hirsuto-ciliati; bracteæ obovato-cuneatæ, obtusæ, 3-4 lin. longæ, glanduloso-fimbriatæ et apice pilis hyalinis articulatis glanduloso-hirsutæ; bracteolæ 2, calycis longitudine, obovato-linearia, apice glanduloso-hirsutæ; calycis segmenta linearia, obtusiuscula, 3 lin. fere longa, hyalino-chartacea, apice parce glanduloso-hirsuta; corollæ omnes casæ; capsulæ calycis longitudine v. paullulo longiores, lineari-oblongæ, 4-angulares, apice hirsutæ, 4-spermæ.—Pegu. St. imbricatæ, NE., affinis.

190. STROBILANTHES KARENSIUM, nov. sp.

Herba perennis, ramosa, magis minusve albo-hirsuta; folia caulina inferiora brevissime petiolata, superiora subsessilia, ovata, brevissime acuminata, membranacea, crenata, utrinque hirsuta, 2-3 poll. longa v. longiora; spicæ breves, densiusculæ, infra basi foliolis nonnullis floralibus subsessilibus hirsutissimis sustentæ, pedunculo stricto hispido terminali v. axillari suffultæ; bracteæ lineares, c. 4 lin. longæ, obtusiusculæ, dense glanduloso-pubescentes; bracteolæ lineari-subulatæ, glanduloso-pubescentes; calyx subscariosus, bracteolarum longitudine, segmentis lato-linearibus albido-marginatis sursum pubescentibus; corolla cyanea, pollicem fere longa, glabra; filamenta secus partem adnatam hirsuta; capsulæ bracteolarum longitudine, dorso pubescentes.—Martaban. Habitu S. acrocephali, characteribus essentialibus autem S. glomeratæ proxima.

191. S. SUBFLACCIDA, nov. sp.

Herba gracilis, glabra, caulibus obsolete 4-gonis sulcatis; folia lanceolata ad oblongo-lanceolata, acuminata, basi in petiolum \(\frac{1}{2} \) poll. longum attenuata, repando-dentata, flaccida, membranacca, 5-6 poll. longa, supra glabra subtus pilis minutis adpressis albidis adspersa; spicæ dense et minute adpresse hirsutæ; bracteæ lato-obovato-oblongæ ad oblongæ v. obovato-lanceolatæ, obtusissimæ v. emarginatæ, minute puberulæ, enerviæ, (purpureo?) coloratæ, c. 2 lin. longæ; bracteolæ paullo breviores, minus obovatæ, 1-nerviæ, minute adpresse pubescentes; calyx bilabiatus, labio superiore glabro usque ad \(\frac{1}{2} \), partem trilobo, lobis obtusis obsolete ciliatis, labio inferiore fere usque ad basin bifido, lobis linearibus obtusis, 1-nerviis extus minute pubescentibus; capsulæ 2-2\(\frac{1}{2} \) lin. longæ, calycem non superantes, clavato-oblongæ, glabræ.—

Tenaserim. (Helf. 6114).

192. STROBILANTHES DASYSPERMA, nov. sp.

Herba erecta, ramosa, subglabra, 8-4 pedalis; folia inferiora magna, 6-8 poll. longa, oblongo-lanceolata ad lanceolata, basi cuneata in petiolum bre-

viusculum decurrentia, acuminata, serrato-dentata, membranacea, ciliata et supra pilis raris brevibus adspersa, subtus glabra et subglaucescentia; superiora caulina multo minora et basi magis rotundata, v. cordata, ovata, haud decurrentia, breve petiolata v. summa sessilia; flores cyanei, in capitula parva glanduloso-puberula pedunculata congesti, paniculam spuriam terminalem glanduloso-puberulam efformantes; bracteæ parvæ, oblongæ, acutæ, glandulosæ; calyx glandulosus, segmentis linearibus 3 lin. fere longis; corolla glabra, infundibuliformis, poll. fere longa; filamenta et stylus sparse pilosi; capsulæ calycis longitudine, obovato-4-gonæ, glanduloso-pubescentes, 4-spermæ, seminibus stupposo-villosulis.—Pequ. Habitu S. Bærhaavioidis, T. And., assimilis, floribus capitatis &c., autem in vicinitatem S. pentstemonoidis, T. And., referenda.

193. BARLERIA STENOPHYLLA, nov. sp.

Herba perennis, inermis, 1-1½ pedalis, subglabra, ramis erectis gracilibus, omnibus partibus plus minusve nitentibus; folia anguste linearia, 3-4 poll. longa, c. 2 lin. lata, spinescenti-acuta, subsessilia, coriacea, integra, supra adpresse hirsutula et sublucida; flores magni, sessiles, fasciculati, bracteati axillares et terminales; bracteæ lucidæ, rigidæ, ovato-lanceolatæ, pungenti acuminatæ, spinescenti-ciliatæ, extus secus costam adpresse hirsutæ; sepala exteriora oblonga, apice 2-fida, rigide ciliata, poll. fere longa, glabra; interiora brevissima, lineari-lanceolata, adpresse pubescentia; corolla circ. 2-pollicaris, puberula, cyanea?, tubo gracili sesquipollicari, lobis 8 lin. longis, rhomboideo-oblongis apiculatis crenatis; capsulæ desunt.—Ava (Dr. J. Anderson).

194. NEURACANTHUS GRANDIFLORUS, nov. sp.

Herba divaricata v. suberecta, subrigida, ramis retrorse-hirsutis v. lineis 2 v. 4 retrorse villosis notatis; folia parva, 1½-2 poll. longa, vulgo obovata v. oblonga, obtusiuscula v. breve acuminata, basi in petiolum brevissimum latum attenuata v. superiora subsessilia, obsolete dentata, membranacea, glaberrima; flores majusculi, pallide v. intense cyanei, spicas elongatas densas v. laxas subtetragonas hirsutas rigide-bracteatas ex foliorum axillis v. e rhizomate protrusas efficientes; bracteæ ovato-lanceolatæ, rigidæ, 5-nerviæ, pubescentes et hirsutæ, acuminatæ, pungentes; calyx bilabiatus, pubescens, secus segmenta linearia parce pilosus, prominenter 5-costatus; corolla ‡ poll. longa, rugata, lobis obtusis; capsulæ tetragono-lanceolatæ, acuminatæ, glabræ, 3 lin. longæ, 4-spermæ; semina sericeo-splendentia.—*Prome*.

195. NEURACANTHUS SUBUNINERVIS, nov. sp.

Herba erecta, probabiliter 1-2 ped. alta; folia adulta &c., ignota; flores albi, parvi, in spicas laxiuscule-bracteatas subtetragonas glandulosas et parce pilosas e rhizomate protrusas disgesti; bracteæ lanceolatæ, pungenti-acuminatæ, rigide membranaceæ, c. 8 lin. longæ, concavæ, medio prominenter

costatæ, costis autem 4 lateralibus obsoletis, glanduloso-puberulæ, secus nervos pilosæ; bracteolæ bractearum longitudine, falcato-lineares, sub-3-nerviæ, acuminatæ, glanduloso-puberulæ et piloso-ciliatæ; calyx profunde, fere usque ad basin, 5-fidus, nervis evanidis, glanduloso-puberulus et piloso-ciliatus, lobo superiore majore c. 4 lin. longo, lineari, acuto, lobis lateralibus paullo brevioribus, subulatis, 2 inferioribus basi tantum connatis et angustioribus; corolla alba, intus præsertim ad labellum brunneo-maculata, extus puberula, 4 lin. fere longa, tubo 2 lin. longo; labium superius emarginatum, marginibus reflexum, inferius 3-lobum, lobis oblongis rotundatis mediano sub-breviori; antherarum loculi compressi, barbatæ, obliquæ; filamenta brevissima, fauci inserta; reliqua ignota.—*Prome*.

196. LEPIDAGATHIS STROBILINA, T. And. MS.

Herba 1-2-podalis, glabra caulibus teretibus elevato-4-lineatis; folia lanceolata, basi cuneata in petiolo decurrentia, acuminata, membranacea, integra, 7-8 poll. longa, glabra et nitentia; capitula florum laxa, terminalia, majora; bracteæ c. poll. longæ, oblongo-lanceolatæ, acuminatæ, tenuiter chartaceæ purpureo-lilacino-tinetæ, 1-nerviæ et reticulatæ, glanduloso-puberulæ; bracteolæ bracteis conformes, angustiores; calyx magnus; corolla magna, purpureo-lilacina, poll. fere longa, infundibuliformis, tubo brevi; capsulæ desunt.—Martaban. (Revd. Parish).

197. JUSTICIA DASYCARPA, nov. sp.

Herba ramosa, 1½-3 pedalis, subglabra, caulibus sopius lineis 4 hirtulis notatis; folia ovata, passim subobliqua, in petiolo gracili longo decurrentia, 3-5 poll. longa, breve acuminata, integra, membranacea; pilis minutis adpressis scabra; flores parvi, candidi, spicas breves laxe bracteatas solitarias axillares v. plures terminales efformantes; bracteæ ovatæ ad ovato-orbiculares, brevissime acuminatæ, 3-4 lin. longæ, membranaceæ, virides, sparse ciliatæ; bracteolæ calyce paullo longiores, lineari-lanceolatæ, puberulæ; calyx 1½ lin. longus, puberulus, lobis lineari-lanceolatis acuminatis; cosolla 3½-4 poll. longa, labio superiore oblongo obtuso, inferiore 3-lobo; antheræ albæ; capsulæ fere 4 lin. longæ, clavatæ, dense puberulæ, 4-spermæ; semina verruculoso-aspera.—Martaban. J. Atkinsonianæ, T. And., affinis, sed floribus longe distat.

198. JUSTICIA CALONEURA, nov. sp.

Herba perennis, erecta, glabra, 2-3 pedalis; folia elliptico-oblonga ad lanceolata, acuta v. acuminata, basi cuneata et secus petiolum totum foliaceo decurrentia, 6-8 poll. longa, integra v. subintegra, membranacea, glabra v. subtus secus nervos laterales numerosos approximatos fugaciter adpresse puberula; spicæ glabræ, terminales, pedunculis brevissimis v. sessiles; bracteæ decussatim oppositæ, sub-or biculares, acutæ v. apiculatæ, ciliatæ, c. ‡ poll. longæ, virides et nervosæ; bracteolæ lineari-lanceolatæ, acuminatæ; calycis

segmenta linearia, minute pubescentia; corolla † poll. longa, extus puberula, intus secus filamentorum bases adnatas villosa, straminea, labio inferiori 8-lobo obscure-striato, labio superiore paullo longiore, concavo, 2-denticulato; capsulæ desunt.—*Martaban*. Præcedenti affinis.

199. JUSTICIA FLAVA, nov. sp.

Herba 2-3 pedalis, erecta, ramosa, subglabra, ramis (præsertim superioribus) 6-5-gonis, parce hirsutulis; folia ovata ad ovato-lanceolata, basi angustata et in petiolum longiorem v. breviorem indistincte hirsutum decurrentia, acuminata, 4-6 poll. longa, integra, membranacca, siccando nigrescentia, utrinque pilis raris brevibus adspersa; flores lutescentes, pedicellis brevissimis, in racemos breves cymæformes paucifloros glabros axillares petioli circiter longitudinis dispositi; bracteæ et bracteolæ remotæ, lineares, parvæ, glabræ; calyx glaber, c. 1½ lin. longus, lobis lineari-lanceolatis, acuminatis; corolla c. 3½-4 lin. longa extus secus venas pubera, tubo brevi, labio superiore concavo, inferiore 3-lobo, faucem versus rugato, lobis rotundatis; filamenta glabra; anthera inferior calcarata; capsulæ clavatæ, tumidæ, acutæ, glabræ ½ poll. fere longæ, 4-spermæ; semina minute rugulosa.—Martaban.

200. DICLIPTERA SPECIOSA, nov. sp.

Herba annua, erecta, ramosa, 1-3 pedalis, pilosa, caulibus sub-teretibus lineis 4 elevatis notatis plus minusve glabrescentibus; folia ovata ad ovatooblonga et lanceolata, in petiolum pilosum v. substupposo-ciliatum 1-2 poll. longum decurrentia, breve acuminata, 5-7 poll. longa, integra, membranacea, utrinque pilis crispatis adspersa; flores albi, raro pallide cyanei, in cymas brachiatas longius v. brevius pedunculatas glanduloso-pubescentes v. pilosas congregati et paniculam magis minusve compositam efficientes; bracteæ obovato-lineares, obtusæ (v. in var. \(\beta \) acutæ), c. 3-4 lin. longæ; bracteolæ dimidio breviores, lineari-subulatæ; calyx bracteolis vix brevior, minute puberulus, segmentis subæqualibus, lineari-subulatis et minute ciliolatis; corolla 7-8 lin. longa, resupinata, tubo 21 lin. fere longo, labio superiori lineari-lanceolato, obtuso, lobo mediano brevi reflexo, labio inferiore 3-lobo, cymbiformi-complicato, lobis 2 lateralibus horizontaliter patentibus rotundatis; antheræ superpositæ, albæ; capsulæ lato obovato-cuneatæ, glandulosopuberulæ, c. 4 lin. longæ, 4-spermæ; semina verruculis minutis flavescentibus aspera.—Pequ.

Var. a. genuina, bractez obtusz, glanduloso-puberulz; caules glabrescentes; corolla alba, labio inferiore coccineo-punctato; pedunculi glanduloso puberuli, breviores (forma umbrosa).

Var. β. pilosa, caules, inflorescentia &c., patenter-pilosa; bracteæ lineares acutæ, pedunculi vulgo longiores; corolla præcedentis, raro pallide cyanea, intus atropurpureo-maculata, (forma arida, an species?)

Acanthacearum genera in regno Burmanico adhuc observata secundum systema Neesianum paullisper mutatum sic distinquenda:

- Subord. I. Thunbergee. Calyx ad annulum dentatum v. nudum reductus. Corolla 5-loba, subregularis. Antheræ 2-loculares, loculis parallelis. Semina globosa, placentæ cupulari insidentia. Capsulæ rostratæ.
- Thunbergia, L. F. Genus unicum. Herbæ v. frutices scandentes raro suberecti.
- Subord. II. Acanthace. Calyx bene evolutus, 5-partitus -fidus v.dentatus, regularis v. irregularis. Corolla varia. Antheræ 2 v. 1-loculares, loculis parallelis, obliquis v. superpositis. Semina compressa, raro globosa, retinaculis uncatis v. glauduliformibus sustenta. Capsulæ non rostratæ. Herbæ v. fructices sæpius erecti, raro scandentes v. prostratæ.
- Trib. 1. ACANTHEE. Calyx inæqualis. Corolla fissa in labellum unicum magnum expansa. Antheræ 1-loculares, v. eæ paris inferioris oblique 2-loculares. Capsulæ a basi seminiferæ. Semina compressa, retinaculis uncatis sustenta.
 - Corolla in labellum magnum expansa, lobis superioribus omnino suppressis v. rudimentariis, tubus brevissimus v. nullus.
- 2. Acanthus, L. Spicæ co-floræ. Antheræ omnes 1-loculares.
- Blepharis, Juss. Spicæ unifloræ; flores bracteis pluribus sæpius spinosis sterilibus circumdati. Antheræ paris inferioris 2-loculares.
 - ** Corollæ tubus longus, limbus 5-lobus usque ad tubum fis-
- Crossandra, Salisb. Bracteæ inermes, in acumen spinosam productæ.
- Trib. 2. RUELLIEE. Calyx magis minusve irregularis, sæpizs bilabiatus. Corolla infundibuliformis, hypocraterimorpha v. raro ringens. Stamina 4 v. 2; antheræ 2-loculares, loculis parallelis,
 rarissime obliquis (nec autem superpositis). Capsulæ basi
 sterili attenuatæ v. a basi seminiferæ. Semina compressa,
 retinaculis uncatis sustenta.
 - ** Barlerieæ Calyx 3-partitus, sepalis decussatis, 2 exterioribus sæpius majoribus. Capsulæ a basi seminiferæ.
- Barleria, L. Corolla infundibuliformis. Stamina 4, raro 5, quorum 2 v. 3 sæpius sterilia et rudimentaria; antherarum loculi paralleli.
 - ** Neuracanthea. Calyx 5-fidus, irregularis, v. bilabiatus, v. segmento superiori tantum maximo. Corolla bilabiata

- et ringens, v. infundibuliformis. Antherarum cellulæ parallelæ v. obliquæ. Capsulæ a basi seminiferæ.
- O Calyx bilabiatus. Capsulæ dissepimenta non secedentia. Spicæ rigidæ v. scariosæ, vulgo 4-stichæ.
- 6. Neuracanthus, N. E. Stamina 4; antherarum loculi obliqui. An potius cum genere sequenti conjungendum?
- 7. Lepidagathis, Willd. Stamina 4; antherarum loculi paralleli.
 - OO Calycis segmentum superius maximum et bracteiforme. Capsulæ dissepimenta in lamellas 2 seminifera secedentia.
- 8. Phaylopsis, Willd. Stamina 4; antherarum loculi paralleli. Spicæ breves bracteis membraneis mollibus vestitæ.
 - *** Ruellineæ. Calyx 5-fidus, segmentis magis minusve inæqualibus. Corolla infundibuliformis. Stamina 4; raro
 2. Capsulæ magis minusve 4-gonæ, cum v. absque basi contracta sterili.
 - 9. Ruellia, L.
- 10. Hemigraphis, N. E. Genera inter se valde affinia postea a
- 11. Strobilanthes, Bl.) me accuratius cruenda.
- Trib. 3. Eranthemee. Calyx regularis, 5-dentatus v.-fidus Stamina 2, raro 4; antheræ 2-loculares, loculis parallelis. Capsulæ 2-4-spermæ, in basin longam sterilem contractæ. Semina compressa, retinaculis uncatis suffulta.
 - Spicæ v. paniculæ nudæ, i. c. bracteis minutis, persistentibus.
- Asystasia, Bl. Corolla infundibuliformis, in tubum longiusculum v. rarius longissimum attenuata. Flores omnes fertiles. Capsulæ vulgo 4-spermæ.
- Eranthemum, L. Flores 2-5-morphi, fertiles minuti, clausi v. apperti; steriles speciosi, hypocraterimorphi, limbo subregulari tuboque longissimo.
 - OO Spicæ foliaceo-bracteatæ, bracteis nonnunquam deciduis.
- Daedalacanthus, T. And. Corolla contorta, hypocraterimorpha, limbo regulari explanato v. complicato, capsulæ vulgo 4-spermæ.
- Ecbolium, Kurz. Corolla imbricata, hypocraterimorpho-bilabiata limbo irregulari, labio superiori reflexo lineari. Capsulæ vulgo 2- raro abortu 1-spermæ, (ovuli in ovarii loculis semper 2).
- Trib. 4. JUSTICIEE. Calyx regularis. Corolla utplurimum ringens v. bilabiata. Stamina 2; antheræ 2-loculares, loculis superpositis. Capsulæ compresso 4-gonæ, in basin sterilem contractæ. Semina plana, retinaculis uncatis suffulta.

- Corollæ tubus longus, gracilis, limbi lobos longitudine superans.
- Rhinacanthus, N. E. Limbi labium superius angustum, erectum.
 Antherarum loculi haud calcarati.
 - OO Corollæ ringentis tubus brevis.
- Justicia, L. Antherarum loculi inferiores basi mucronati et calcarati. Capsulæ dissepimenta persistentia.
- Rungia, N. E. Characteres præcedentis, sed capsulæ dissepimenta a valvis secedentia.
 - OOO Corolla bilabiata, tubo gracili longitudine loborum v.
- 19. Dicliptera, Juss. Capsulæ dissepimenta a valvis secedentia.
- 20. Peristrophe, N. E. Capsulo dissepimenta persistentia.
- Trib. 5. APHELANDREE. Calyx regularis. Corolla bilabiata, Stamina 4; antheræ 1-loculares, lineares v. oblongæ. Capsulæ vulgo a basi seminifera. Semina plana, retinaculis uncatis suffulta. Fere omnes Americanæ, inter Indica genus unicum (Hypæstes) hic rite referendum, extera genera hic relata abnormalia esse videntur, viz. Monothecium (Justiciæ sect. Rostellariæ nimis affine) et Hypæstes triflora, Roem. et Schult., calyce a congeneris valde discrepans potius generi Diclipteræ adnumeranda, v. generis novi typum præbens. Haplanthi genus infra inter Hygrophileas quærendum.
- Trib. 6. Hygrophile.e. Calyx regularis v. irregularis, 5-fidus v. -dentatus. Corolla bilabiata ringens. Stamina 2 v. 4; anthere 2-loculares, loculis parallelis. Capsulæ planiusculæ v. cylindricæ, sæpius striatæ, sulcatæ v. medio impressæ, a basi seminiferæ. Semina compressa, retinaculis uncatis suffulta.
 - O Corolla infundibuliformis et subringens. Capsulæ cylindricæ v. subcylindricæ. Stamina 4 v. 2.
- 21. Phlogacanthus, N. E. Capsulæ 8-2 -spermæ; stamina 4, fertilia.
- Cystacanthus, T. And. Characteres præcedentis, sed stamina fertilia 2, cum 2 rudimentariis.
- 23. Graptophyllum, N. E. Capsulæ 4-spermæ. Stamina 4, omnia fertilia.
 - OO Corolla ringens. Stamina 2. Capsulæ planiusculæ, sursum sæpius latiores.
 - Antheræ basi sæpius barbatæ v. villosæ. Racemi v. paniculæ nudæ.
- 24. Andrographis, Wall. Antherse 2-loculares.

- 25. Haplanthus, N. E. Antheree 1-loculares.
 - ** Antherse nudse.
- 26. Hemiadelphis, N. E. Spice conspicue bracteateo.
 - OOO Corolla bilabiata v. ringens. Stamina 4. Capsulæ magis minusve teretes, sæpius sulcatæ.
- 27. Hygrophila, R. Br. Calyx tubulosus, regularis. Corolla bilabiata.
- 28. Nomaphila, Bl. Calyx usque ad basin 5-fidus. Corolla ringens.
- Trib. 7. Nelsonie E. Calyx 5-fidus, utplurimum subirregularis. Corolla infundibuliformis v. personata. Stamina 2 v. 4; anthera 2-loculares, loculis parallelis. Capsulæ a basi seminifera. Semina minuta, globosa, retinaculis glanduliformibus suffulta, v. iis omnino deprirata.
 - O Stamina 2.
- 29. Nelsonia, R. Br. Corolla ringens.
 OO Stamina 4.
- 30. Ebermaiera, N. E. Corolla ringens.
- 31. Cardianthera, Ham. (Adenosma, N. E. non R. Br). Corolla personata.

VERBENACEÆ.

201. VITEX CANESCENS, nov. sp.

Arbuscula 25—35 pedalis, partibus omnibus junioribus canescenti v. gilvescenti-pubescentibus; folia digitatim 3—5—foliolata, petiolo 1—2—pollicari tomentello suffulta; foliola sæpius breve (intermedio multo longius) petiolulata, ovata v. ovato-lanceolata, ad elliptica et elliptico-lanceolata, acuminata v. acuta, basi attenuata, integra, v. raro crenato-serrata, membranacea, juniora utrinque dense canescenti-pubescentia, supra denuo scabrescenti-puberula; flores albi, parvi, pedicellis gracilibus 1—2 lin. longis tomentellis suffulti, glomerati, paniculas cinereo- v. gilvescenti-tomentellas compositas v. simplices terminales et supra foliorum delapsorum ortas efficientes; calyx cinereo-pubescens, lin. circiter longus, 5-dentatus; corolla calyce duplo longior, extus tomentosa; drupæ obovoideæ, læves, pisi magnitudinis, calyce magis minusve explanato insidentes.—Prome. V. Negundo, L., affinis, differt inprimis floribus graciliter pedicellatis.

LAURINEÆ.

- 202. Machilus fruticosa, nov. sp.
- Frutex glaber, gemmis velutinis; folia ovato ad ovato-oblonga, 2½—4 poll. longa, basi rotundata subdecurrentia, petiolo crasso lato 2—5 lin. longo, glabra, rigide coriacea, obtusa et passim rotundata, marginibus recurvis, subtus glauca, nervis, simul cum reticulatione copiosa, prominentibus;

flores...; paniculæ folio longiores, glabræ, longe-pedunculatæ; pedicelli sub fructu brevissimi (1—1½ lin. longi) et incrassati uti in *Phæbe*; perianthium minute adpresse pubescens, segmentis patentibus oblongis obtusis; fructus globosi, glabri, pisi magnitudinis.—*Martuban* (Dr. Brandis).

203. TETRANTHERA (CYLICODAPHNE) CALOPHYLLA, nov. sp.

Arbuscula, novellis fulvescenti-tomentellis; folia ovato-oblonga ad lanceolata, basi acuta v. acuminata, longius v. brevius acuminata, petiolo $\frac{1}{3}$ —1 poll. longo magis minusve tomentoso suffulta, rigido membranacea, $3\frac{1}{3}$ —7 poll. longa, supra lutescenti-viridia et (costa immersa excepta) glabra, subtus pallida, tomentella, penninervia, prominenter reticulata; flores in umbellam parvam bracteatum congesti; umbellæ pedunculo $2\frac{1}{3}$ — $3\frac{1}{3}$ lin. longo tomentello solitario axillari suffultæ v. secus ranulum novellum axillarem fulvo tomentosum quasi racemiformem disgestæ, raro in racemum verum brevem corymbiformem pedunculo fulvescenti-puberulo suffultum efformantes; involucri foliola concavo-rotunda, puberula; perianthium extus pubescens; filamenta glabra; antheræ 4-locellatæ; baceæ oblongo-ovatæ, $\frac{1}{2}$ poll. fere longæ, læves, carnosæ, cupulâ majusculâ truncatâ extus minute pubescenti in pedicellum brevem crassum attenuatâ suffultæ.—Martaban, Tenasserim. Species quoad folia et inflorescentia variabilis, Cylicod. Wightianæ, N. E., arcte affinis ejusve probabiliter varietas insignis?

204. TETRANTHERA (CYLICODAPHNE) NUCULANEA, nov. sp.

Frutex ramulis teretibus tomentosis; folia obovato-oblonga ad oblongo-lanceolata, petiolis 4—5 lin. longis pallide-tomentosis suffulta, basi acuta, 5—6 poll. longa, obtusiuscule apiculata, crasse chartacea, supra glabra, subtus glauca et plus minusve dense puberula, reticulatione inter nervos laterales crassiusculos tenui sed conspicua; flores ..., apparenter umbellas subsessiles axillares formantes; pedunculus in speciminibus fructigeris crassissimus vix 3 lin. longus; fruetus pallide straminei, oblongi, c. 6—7 lin. longi, læves, cupula integra magna carnosa suffulti.—*Tenasserim*. (Revd. Parish).

205. TETRANTHERA (CYLICODAPHNE) ALBICANS, nov. sp.

Arbuscula, novellis minute puberulis; folia oblongo-lanceolata ad lanceolata, basi attenuata, petiolo 5—8 lin. longo gracili subglabro suffulta, breve acuminata, chartacea v. tenuiter coriacea, 6—10 poll. longa, glabra, subtus albida, reticulatione inter nervos tenues prominentes tenui sed conspicua; umbellæ involucratæ, velutino-tomentosæ, pedunculo gracili c. 4 lin. longo canescenti-tomentoso suffulti, in racemum abbreviatum v. subsessilem velutino-tomentosum axillarem v. vulgo supra foliorum delapsorum cicatricibus orientem dispositi; involucri phylla canescenti-velutina; fructus . .; cupula

magna, carnosa, undulato-lobata, in pedicellum crassum attenuata.—Pegu. Ex affinitate T. Panamojæ, N. E.

206. LITSÆA LEIOPHYLLA, nov. sp.

Arbor inflorescentiis exceptis glaberrima; folia lanceolata v. oblongo-lanceolata, 5—6½ poll. longa, basi subinæquali acuminata, petiolo gracili 1—1½ pollicari glabro suffulta, obtuse acuminata, tenuiter coriacea, glaberrima, supra lucida, subtus vix glaucescentia, supra basi triplinervia et penninervia, obsoletissime reticulata; flores fulvo-villosi, pedicellis brevibus tomentosis suffulti, racemos axillares petiolo breviores abbreviatos fulvo-villosos simplices formantes; filamenta glabra; baccæ desunt. Tenasserim v. Andamans. (Helf. 4330).

207. DAPHNIDIUM ARGENTEUM, nov. sp.

Arbor parva, novellis argenteo-scriceis; folia lanceolata v. lato-lanceolata, utrinque acuminata, petiolo 3—5 lin. longo argenteo-pubescente glabrescente suffulta, 3½—6½ poll. longa, crasse chartacea, supra glabra, subtus adpresse argenteo-sericea, penninervia, utrinque laxe reticulata; flores virescenti-lutei, pedicellis brevissimis tomentosis, in racemum bravem tomentosum basi bracteis concavis pubescentibus involucratum disgesti; perianthium 6-fidum, extus adpresse pubescens; antheræ 2-locellatæ; filamenta subglabra.—Pegu, Marluban.—Species insignis, foliorum structura et habitu Beilschmiediæ genus in mentem revocat.

PROTEACEÆ.

208. HELICIA PYRRHOBOTRYA, nov. sp.

Arbor?, novellis ferrugineo-villosis; folia obovato-lanceolata, breve acuminata, versus basin obtusam attenuata, c. pedem longa, petiolis crassis 2-5 lin. longis suffulta, chartacea, grosse serrata, adulta glabra v. subtus secus costam sparse ferrugineo-pubescentia; flores 1-1 poll. longi, geminati, pedicellis crassis $1\frac{1}{2}$ lin. longis ferrugineo-villosis suffulti, racemos c. pedem longos robustos dense ferrugineo-villosos axillares efficientes; squamulæ hypogynæ ...; ovarium stylusque læves. Martaban, (Dr. Brandis).

PODOSTEMACEÆ.

209. HYDROBRYUM LICHENOIDES, nov. sp.

Plantulæ minutæ gregariæ; rhizoma latum membranaceum, lobatum, terræ v. saxis adpressum, viride, vix ½ lin. 'latum, 2—3 lin. longum; folia perpauca tantum pedicellorum basi sita, squamæformia; pedicelli filiformes, ½ lin. longi; capsulæ globosæ, c. ½ lin. in diametro, lato-8-costatæ.—Martaban. (Revd. Parish).

URTICACEÆ.

210. Elatostema membranifolium, nov. sp.

Suffrutex erectus, ramosissimus, *E. lineolati* habitu, glaberrimus, ramulis 4-quetris, lævissimis; folia alterna, subinæqualia, cum basi inæquali sessilia, 1½—2½ poll. longa, acuminatissima (acumine obtuso et integro), tenuiter membranacea, grosse et obtusiuscule crenato-serrata, utrinque lævia et striis destituta, basi irregulari-triplinervia, nervis tenuibus sed conspicuis, per nervos laterales strictis rectangulares cum costa anastomozantibus; stipulæ minutæ. subulato-lineares; flores minuti, sessiles, capitula (nondum evoluta) parva sessilia in foliorum axillis v. iisdem opposita formantes; perianthium glabrum.—*Tenasserim*, (Dr. Brandis)—*E. lineolato*, Wight, arcte affine, absentia striolarum autem tute distinguendum.

211. Elatostema bulbiferum, nov. sp.

Herba monoica v. dioica, erecta, $\frac{1}{3}$ —1 pedalis, succulenta, simplex v. sub-ramosa, glabra, caulibus teretibus ad internodia bulbiferis; folia opposita, dimorpha, quorum evoluta obliqua, ovata v. ovato-lanceolata, petiolis vix lin. longis suffulta, superiora cum basi inæquali subsessilia, $2\frac{1}{2}$ — $3\frac{1}{2}$ poll. longa, grosse serrata, herbacea, breve acuminata, glabra, supra setiis albis adnatis obtecta, basi triplinervia, passim nervis nonnullis adjectis; folia stipuliformia, lanceolata ad ovato-lanceolata, magis variabilia, $\frac{1}{4}$ — $\frac{1}{2}$ poll. longa, acuta v. obtusa, integra v. serraturis nonnullis, inferiora vulgo majora; stipulæ minutæ, subulatæ; flores minuti, pedicellati, cymosi; cymi feminei densiores et pedunculis gracilibus brevioribus suffulti; masculi laxi, pedunculo 1—2 pollicari suffulti e tuberibus globulosis crassis axillaribus v. in ramulorum furcationibus sitis subvillosis orti; perianthium glabrum.—Tenasserim, Arracan.

212. Elatostemà gibbosum, (Procris gibbosa, Wall., Cat. 7273).

Herba procumbens, repens, glahrescens, caulibus ascendibus c. semipedalibus florigeris; folio alterna, obovato-oblonga ad trapezoideo-oblonga, subobliqua, cum basi oblique-cordata subsessilia, obtusa v. subobtusa, 2—3 poll. longa, herbacea, grosse rotundato-crenata, supra pilis brevibus albis transverse adnatis adspersa, subtus secus nervos parce pubescentia, basi 3—5—plinervia; stipulæ conspicuæ, membranaceæ, brunneæ, usque ad 3 lin. longæ, lanceolatæ, acuminatæ, persistentes, etiam eæ foliorum abortivorum evolutæ; flores masculi majusculi, c. 1 lin. in diametro, subsessiles, in cymam parvam pedunculo 1½—2 poll. longo pubescente axillari suffultam collecti; perianthium glabrum.—Martaban, Tenasserim.—In vicinitate E. cornuti ponendum; an potius generi Pellioniæ adscribendum?

213. Dorstenia Griffithiana, nov. sp. (D. sp. Griff. Not. Dicot. 403).

Frutex humilis, ramulis angularibus ochraceo-pubescentibus; folia elongato-obovata ad cuncato-clliptica, petiolo crasso \(\frac{1}{2}-\frac{3}{2}\) pollicari pubescente glabrescente suffulta, basi angustata acuta v. rotundata, 8 poll.—1\(\frac{1}{2}\) ped. longa, abrupte acuminata, tenuiter coriacea, integra, supra lævia, subtus scabra; stipulæ setaceæ, pubescentes; flores monoici, in receptaculis capituliformibus involucratis extus velutinis pedunculatis congregati; pedunculi velutini solitarii, axillares; involucrum sub 4—6 partitum; syncarpia dimorpha, involucri bracteis reflexis velutinis.—Tenasserim.

214. Figus Affinis, Wall., Cat. 4524.

Arbor mediocris, glabra; stipulæ breves, et parvæ, ovato-lanceolatæ, glabræ; folia elliptica ad ovato-oblonga, basi obtusa v. rotundata, obtusiuscule et subabrupte acuminata, 3—4 poll. longa, chartacea, integra v. subundulata, glabra, basi nonnunquam obscure 3-nervia, nervis lateralibus numerosis et subparallelis secus marginem anastomozantibus, utrinque crebre reticulata; receptacula piperis grani magnitudine v. paullo majora, globosa; flavescentia, pustulis obsoletis aurantiacis adspersa, glabra, basi 3-bracteata, pedunculo brevissimo ½—1 lin. suffulta, vulgo geminata in foliorum axillis v. supra foliorum delapsorum cicatricibus; bracteæ persistentes, minutæ, lato-triangulares.—Pegu, Tenasserim, Andamans.—Prope F. rhododendrifoliam, Miq., inserenda.

215. Ficus geniculata, nov. sp.

Arbor magna epiphytica, ramulis robustis cicatrisatis novellis pubescentibus; stipulio lato-ovatæ, acutæ, glabræ v. canescentes; folia elliptica, elliptico-ovata v. elliptico-oblonga, petiolo 3—4 pollicari apice geniculato inserta, basi obtusa v. acuta, breve et abrupte acuminata v. apiculata, integra, rigide coriacea, utrinque lucida, basi breve 3-nervia, nervis lateralibus subparallelis et magis approximatis sæpius subobsoletis, reticulatione elegante magis minusve obsoleta raro conspicua percursa; receptacula globosa, pisi minini v. piperis grani magnitudine, flavida, albo-pustulata, glabra, 3—4 bracteata, sessilia v. subsessilia, in foliorum axillis v. supra eorum cicatribus geminata; bracteæ persistentes, lato-rotundatæ, brunneæ, glabræ.—Pega, Martaban, Tenasserim.—Ex affinitate F. infectoriæ, Willd.

216. Ficus insignis, nov. sp.

Arbor mediocris, ramulis crassis cicatrisatis tomentellis; stipulæ latoovatæ tomentosæ; folia iis *F. geniculatæ* subconsimilia, elliptica ad ovatooblonga, petiolo 2—3 poll. longo apice geniculato suffulta, basi rotundata
v. obtusa, 5—7 poll. longa, obtuse apiculata, integra v. subundulata, glabra,
rigide coriacea, supra lucida, nervis lateralibus subparallelis et moderate
approximatis, secus marginem arcuato anastomozantibus, subimpressis, reticulatione elegante vix prominente; receptacula cerasi minimi magnitudine,

globosa v. subglobosa, cinerascenti albida, rosco-punctata, dense tomentoso-villosa, basi bracteata, pedunculo crasso brevissimo tomentoso suffulta, in foliorum axillis v. supra eorum cicatricibus vulgo geminata; bracteæ persistentes, lato-ovatæ, scariosæ, brunneæ, glabræ.—*Prome*. Præcedenti affine.

217. FICUS CALONEURA, nov. sp.

Arbor glabra; folia iis *F. Rumphii* consimilia, cordato-ovata, sensim obtusiuscule-acuminata, basi cordata, petiolo 3—4 poll. longo apice geniculato bi-glanduloso suffulta, 4—5 poll. longa, 2½—3½ poll. lata, grosse et remote repando-dentata, tenuiter coriacea, glabra, utrinque opaca, supra haud punctata, nervis lateralibus unacum nervis basilaribus omnibus divergentibus et subarcuatis pallidis crassis secus marginem anastomozantibus, nervatione transversali elegante sed tenuiuscula; receptacula desunt.—Burma, sine loco natali, (Dr. Brandis).—Ex affinitate *F. Rumphii*, Bl.

218. FICUS POMIFERA, nov. sp.

Frut x scandens, glaber; folia obovata v. sub-rhomboideo-obovata, petiolis 3—4 lin. longis scabridīs, basi subcuncata, 1—2½ poll. longa, obtusa v. subcmarginata, glabra, coriacea, marginibus subrecurvis, nervis utrinque 4—5 lateralibus paullo prominentibus, in areolis reticulationis obsoletæ lacunoso-punctata; receptacula pomiformia v. oblongo-elliptica, c. 1—1½ poli. crassa, subumbonata, in stipitem brevissimum (c. ½ lin.) crassum constricta, lævia, miniato-aurantiaca, pedunculo crasso 1—2 lin. longo puberulo suffulta, vulgo solitaria e foliorum axillis v. supra corum cicatricibus; bracteæ ad pedunculi apicem 3, persistentes, triangulari-ovatæ, subglabræ. Variat. a. pomiformis, receptacula pomiformia,—Tenasserim, (Falconer); β. oviformis, receptacula elliptico-oblonga ad ovoidea,—Sumatra.

219. FIGUS PYRRIIOCARPA, nov. sp. (F. tuberculata, Wall., Cat. 4539, non Roxb. et aliorum).

Frutex humilis, 1—3 pedalis, ramulis adpresse brunneo-setosis; stipulæ lineari-lanceolatæ, acuminatæ, glabriusculæ v. dorso pubescentes; folia obverse lanceolata ad subcuneato-lanceolata, basi cuneala v. acuta, petiolo lineas perpaucas usque ad 1½ poll. longo adpresse pubescente glabrescente suffulta, breve et obtusiuscule acuminata, integra, crasse membranacea, supra glabra v. pilis minutis inconspicuis adspersa, subtus secus nervos sparse adpresse hirsuta et glabrescentia, nervis arcuatis, reticulatione laxa; receptacula depresso-pyriformia, cerasi magnitudinis, purpurascenti-viridia, costata, squamis nonnullis varie dispositis adspersa, præsertim dum juvenilia pilis rigidis adpressis v. subpatentibus brunneis v. rufis obtecta, pedunculis ‡—1‡ pollicaribus pubescentibus crassis suffulta, solitaria e trunco subterraneo orta v.

secus surculos aphyllos subterraneos errumpentia; bractez ad apicem pedunculi 3, ovatze, breves.—Pegu, Martaban.—Ex affinitate F. ischnopodæ, etc.

219. FIGUS ANASTOMOZANS, Wall., Cat. 4513.

Frutex repens, humilis, magis minusve scabro-pubescens; stipulæ minutæ, scabræ; folia oblongo-lanccolata ad lanccolata, basi acuta v. obtusa, petiolo 2—6 lin. longo scabro-pubescente suffulta, magis minusve obtusius-cule-acuminata, 2—4 poll. longa, grosse et irregulariter sinuato-dentata, dentibus rotundatis v. obtusis, membranacea, supra scabro-pubescentia, nonnunquam subglabrescentia, nervis numerosis rectangulari-divergentibus et anastomozantibus; receptacula ovoidea, piperis grani magnitudinis, umbonata, basi non v. vix constricta, scabro-puberula, pedunculo vix ½ lin. longo et pubescente suffulta, solitaria e foliorum axillis v. supra eorum cicatricibue errumpentia; bracteæ minutæ.—*Tenasserim*.

220. FICUS LEPIDOSA, Wall., Cat. 4541.

Arbor mediocris, novellis parce pubescentibus; stipulæ lineari-lanceo-latæ, acuminatissimæ, glabræ v. subglabræ; folia obovata ad elliptica, petiolis 1—2 poll. longis parce pubescentibus glabrescentibus suffulta, basi obtusa. breve acuminata, 5—6 poll. longa, crasse membranacea, supra glabra v. pilis nonnullis brevibus adspersa, subtus parce et breve pubescentia, subpenninervia; receptacula turbinato-globosa, umbonata, pubescentia, aurantiaco-miniata, cerasi magnitudine, pedunculo 3—5 lin. longo crasso pubescente sustenta, vulgo geminatim e foliorum axillis v. supra eorum cicatricibus erumpentia; bracteæ ad apicem pedunculi, ovatæ, acutæ, glabræ, c. lin. longæ.—Pegu.—F. chrysocarpæ, Rwdt., affinis, errore quoddam cl. Miquel in Annalis suis me hanc speciem cum F. diversifolia identicam declarasse putavit.

AMENTACEÆ.

221. QUERCUS EUMORPHA, nov. sp.

Arbor 20—30 pedalis, glaberrima; folia ovato-oblonga v. oblonga, non-nunquam inæqualia, basi in petiolum gracilem 5—8 lin. longum glabrum attenuata, breve et obtusiuscule acuminata, 3—4 poll. longu, coriacea, apicem versus leviter obtusiuscule serrata, glabra, concoloria, nervis tenuibus et reticulatione densa subobsoletis; pedunculus fructiger usque ad 2 poll. longus, apparenter glaber, 1 v. 2 fructus gerens; glans ovoidea, 9—10 lia. fere longa, lævis, exserta; cupula 7—8 lin. in diametro, concava, crasse coriacea, brunnea, glabra, subvernicosa, junior squamis triangularibus acutis adpressis subdistinctis dein in zonas concentricas angustas inæquales et irregulares confluentibus obtecta v. rugato-rugosa.—Martaban.

222. QUERCUS BRANDISIANA, nov. sp.

Arbor parva v. mediocris, ramulis canescenti, v. ochraceo-pubescentibus; folia oblonga ad obovato-oblonga, basi sæpius inæqualt acuta v. obtusa, 4—5 poll. longa, petiolo 5—8 lin. longo gracili glabro suffulta, breve et obtusiuscule acuminata, obtusiuscule repando-serrata, utrinque subopaca, tenuiter coriacea, supra rugata et glabra, subtus glauca et fugaci-puberula, nervis supra impressis strictis subtus prominentibus sed tenuibus, cum nervatione transversa conspicuis; pedunculus fructiger c. 1, raro usque 2½ poll., longus, fructus paucos tantum gerens, ochrascenti-tomentosus; glandes juniores depressæ adpresse puberulæ, magis minusve inclusæ, dein exsertæ, ovoideæ, glabræ; cupula canescenti-velutina, concava, c. ½ poll. in diametro, e zonis cire. 5—6 concentricis lamellatis erosis formata.—Martaban.—In

CIILORANTHACEÆ.

223. CILORANTHUS INSIGNIS, nov. sp.

Suffrutex 1½—2 pedalis, glaber, in sicco sublutescens; folia petiolis 1—2 lin. longis suffulta, linearia, basi acuminata v. acuta, sensim et longissime acuminata, 3½—4½ poll. longa, subcoriacea, integra, glabra, nervis lateribus tenuissimis, vix reticulata; spicæ axillares, fructiferæ 1—2 poll. longæ, simplices, glabræ; bracteæ minutæ, crassæ; fructus casi.—Murtaban.

SCITAMINEÆ.

HEMIORCHIS nov. sp.

Flores præcoces, spicati, sessiles. Calyx tubulosus, sursum ampliatus, 3-fidus. Perianthii tubus calyce brevior filiformis; phylla 3 exteriora æqualia, interiora subæquilonga, basi utrinque corniculata apice 2—3 denticulata; labellum lato-oblongum, concavum, apiculatum. Filamentum phyllis fere duplo brevius, apice incurvum, connectivam supra anthera utrinque mutica vix productum. Ovarium 1-loculare, placentis 3 parietalibus; stylus filiformis; stigma paullum incrassatum, oblique truncatum. Capsula 1-locularis, subplicato-10-sulcata, 3-valvis; semina conica, basi albo-arillata.—Herbæ perennes Gastrochilo habitu et characteribus essentialibus affines; scapis radicales pallidi squamati iis Geodori haud absimiles.

224. H. BURMANICA, nov. sp. Tab. VIII.

Rhizoma album, crassum, repens, hypogæum, nudum; folia post anthesin erumpentia iis *Gastrochili* simillima, lato-oblonga, brevissime acuminata, basi inæquali-rotundata in petiolum brevem decurrentia, glabra; vaginæ striatæ, glabræ; scapi radicales, solitarii, dense tomentelli, a basi usque ad medium bracteis amplis pallidis remotis v. confertis 1—1½ poll. longis oblongis et subacutis vestiti; flores spicati, sessiles, mediocres; calyx puberulus, albus,

3-fidus, lobis æqualibus acutis; perianthii phylla exteriora 3 fere semipollicaria, virescenti-albida, oblongo-linearia, apiculata v. 2—3 lobulata, marginibus magis minusve recurva, superiori latiore; interiora 2 obovato-oblonga, pallide rubella, apice obsolete 2—3 denticulata; labellum concavum lato oblongum, aurantiacum, basin versus pallidius, intus secum carinam sanguineum carinatum, carina in apiculum 3-angularem acutum excurrente; antheræ cerino-lutæe, filamenta c. 1 lin. longa, incurva; capsulæ ovales, puberulæ, calyce emarcescente coronatæ, c. \(\frac{1}{2} \) poll. longæ; semina basi arillo albo suffulta.—Pequ, Martaban, Tenasserim.

MELANTIIACEÆ.

STEMONA GRIFFITHIANA, nov. sp. Tab. X. (Gen. nov., Griff. Journ. of Travels p. 149).

Herba erecta, perennis, glabra, rhizomate crasso hypogæo; folia hysteranthia, ovata, c. 3—5 poll. longa, breve acuminata, petiolo 3—5 poll. longo suffulta, chartacea, glabra, parallelinervia, eleganter transverse venosa, sericanter-nitentia; flores virescenti v. sordide purpurci, pedicellis strictiusculis poll. circiter longis suffulti, in turionibus erectis aphyllis scapiformibus dein foliatis 3—6 poll. longis corymboso-racemosi; bracteæ lineari-lanceolatæ acuminatæ, c. 3—4 lin. longæ; perigonium 4-phyllum, phylla poll. longa, v. paullo longiora, lineari-lanceolatæ, acuta; stamina 4, filamenta lata, purpurea; antheræ aurææ, cuspidatæ; ovarium 1-loculare, ovulis 6, lineari-oblongis ex apice pendulis capsulæ compresso-ovatæ, semipollicares, bivalves, 3—4 spermæ; semina sulcato-carinata, lineari-oblonga, subapiculata, basi arillo brevi albo aucta.—Ava, Martaban, Pequ.

AROIDEÆ.

HAPALINE, Schott.

Spatha lanccolata sursum plana, basi tantum complanata et spadicis parti femineæ adnata. Spadix interrupte androgynus, genitalibus rudimentariis nullis. Stamina lineari-lanceolata, peltata, membranacea, areolatoreticulata, subtus marginem versus antheras 4—6 minutas globosas gerentia, spadicem linearem a parte feminea paullo discretum obtegentia. Ovaria singula serie superposita, unilocularia, ovulo solitario erecto; stigma subsossile, subcapitatum.—Herbæ humiles, radice tuberosa, uni- v. pauci-foliatæ, spathas niveis.

1. H. BENTHAMIANA, Schott. Tab. IX.

Herba c. semipedalis, radice tuberosa, basi albo-vaginata; folia 3—4 poll. longa, petiolo equilongo suffulta, oblonga, basi profunde sinuato-cordata, lobis basilaribus complicatis et obtusiuscule prolongatis, glabra, breve acuminata, nervis anastomozantibus; flores 1—3-ni e rhizomate pro-

trusi, scapo 5—6 poll. longo gracili suffulti; spatha nivea, lineari-lanceolata ad lanceolata, c. 1½ poll. longa, reflexa, reticulata; spadix spathæ fere longitudinis, ejus pars mascula exserta strictiuscula lineari-subulata, alba.—

Martaban.

TABULARUM EXPLANATIO.

Tab. VIII.—Hemiorchis Burmanica.—Fig. A, planta florens, magn. nat.; fig. B, folium cum cauli vaginato, magn. nat.; fig. 1, perigonii phyllum exterioris; fig. 2, phyllum exterius superius; fig. 3, perigonii phyllum interius laterale; fig. 4, labellum cum carina, a latere visum; fig. 5, anthera a latere visa; fig. 6, eadem a fronte; fig. 7, capsula, magn. nat.; fig. 8, semen, arillo remoto.

Tab. IX.—Hapaline Benthamiana.—Fig. A, planta, magn nat.; fig. 1, spadix; fig. 2, ovarium; fig. 3, sectio verticalis fructus, semen immaturum exhibens; fig. 4, squama staminalis antheras gerens, a latere interiore visa.

Tab. X.—Stemona Griffithiana.—Fig. A, planta florens; fig. B, caulis foliati pars superior; fig. C, racemus fructiger; fig. 1, perigonii phylla 2 cum stamine; fig. 2, semen cum arillo, latere visum; fig. 3, capsula aperta, semina exhibens; figuræ omnes magn. nat.

Errores graviores in parte priori (J. A. S. B., vol. XLI, pt. II), corrigendi. Page 311. lin. 6. infra pro apicibus lege apices.

Pag. 312. lin. 10. supra pro pomini mayoris magnitudine lege pomi minoris magnitudine, brunneo-velutinæ.

Notes on some species of Malayan Amphibia and Reptilia,—
by Dr. F. Stoliczka.

(Received 15th Feb. 1872; read 5th March, 1872.)
[With plate XI.]

It is nearly three years ago that I had the pleasure of submitting to the Society a few notes on Indo-Malayan Reptiles and Amphibians, chiefly collected by myself along the Burmese and Tenasserim coasts, about Penang and on the Nicobar and Andaman islands. When visiting Penang in 1869, I received information of a tolerably extensive* collection of Reptiles, brought together by a zealous Jesuit during a residence of about twenty years on the island. The specimens were collected either on Penang itself or on the opposite coast of the Wellesley Province. A very large number had been captured alive, and coloured drawings, taken from most of the live specimens, had been prepared. The colouring appeared to me to have been faithfully copied, and this it was which particularly excited my interest in the collection, because in many cases the colours of Reptiles fade most rapidly, as soon as the specimens are placed in spirit; in others the colouring changes immediately after death, and again some alter even during life their colour, as soon as they become conscious of their captivity. In any case the coloured sketches from life seemed to me valuable and I, therefore, resolved to buy the collection.

As soon as the formal matters were arranged, the collection of the specimens was transmitted to me, the drawings, however, were afterwards not considered to form an essential part of it, and were handed over to some one else, according to a wish of the deceased gentleman under whose supervision they were executed. After a brief correspondence it did not appear to me much use treating further about the subject. My interest in the collection has, on that account naturally enough, partly diminished, and having had other more pressing work to attend to, the specimens were for more than two years left unnoticed. More recently my friend Mr. Stahlknecht of Singapore visited Sumatra, and made for me a very nice little collection of Reptiles, most of which were in a beautiful state of preservation. This circumstance induced me to look over my old acquaintances, and to prepare a critical list of all of them. In the old collection I only found two new species, a Rana and a Simotes, a specimen of the latter had very recently been also obtained by Mr. J. Wood-Mason's collector at Jahore, situated at the extreme south end of the Malayan Peninsula, north of Singapore island. Mr. Stahlknecht's collection yielded a new Calamaria.

This refers to the number of specimens, but not to that of species, as I subsequently discovered.

Thus, although I cannot say, that I came into possession of a great number of new forms, there are among those, which I shall place on record, a few rare and very interesting species, some of which were previously known only from single specimens, and these often were not very perfect. I may mention for instance Draco quinquefasciatus, Podophis chalcides, Ophites subcinctus and albofuscus, Ablabes flaviceps, Oxycalamus longiceps, &c.

I shall first enumerate all the species, and attach an (*) asterisk to those, about which I shall have to say a few words.

The collection was made, as I said, to a large extent on Penang itself or in the Wellesley Province, and judging from the examination of it, I have found no reason to doubt in any way this statement. A great many of the same species had been collected by myself in that part of the country on a former occasion, others were known to occur there from the very elaborate and extensive researches of Dr. Cantor; others again had been recorded from Malacca, Singapore, Sumatra or Java, all countries which belong to the same zoological province, and which have a large number of species common. I have not met with a single instance which would lead me to suspect, that any mixture of other distant localities had taken place. Thus the present list in connection with that of Drs. Cantor, Gray and Günther, and my own published in 1870, may be considered as fairly completing the number of Reptiles and Amphibians, inhabiting Penang and the neighbouring Wellesley Province. Mr. Stahlknecht's specimens are from the neighbourhood of Dilli on Sumatra. In the general list I shall briefly note the localities as Penang and Sumatra.

BATRACHIA.+

- Rana tigrina, var. pantherina, Fitz. apud Steindachner. (Novara Amphibiens).—Penang.
 - 2.* " fusca, Blyth.—Penang.
 - 3. , lymnocharis, Boie (= gracilis, Wiegm.); typical.—Penang.
 - 4.* " lymnocharis, var. pulla, Stol.—Penang.
 - 5.* " plicatella, n. sp.—Penang.
 - 6. Polypedates maculatus.—Penang.
 - 7. , quadrilineatus.—Penang and Sumatra.
 - Hylarana erythæa.—Penang and Sumatra.
 Comp. Proceed. A. S. B. for June, 1872, p. 104. The largest specimen measures: body 3 inch, hind limb 5 inch.
 - 9. Bufo melanostictus.—Penang.
- † If no special reference to literature is given, it is understood that the species is described in Dr. Günther's Reptiles of Brit. India, or in my former paper on Malayan Reptiles in Journal A. S. B. vol. xxxix, pt. II.

- 10. Bufo asper .- Penang.
 - Largest specimen, body 5.5 inch. long.
- 11. Epicrium qlutinosum.—Penang.

SAURIA.

- Euprepes carinatus, Schneid., = rufescens.—Penang and Sumatra.
 All have a rufescent bronzy tinge and dorso-lateral pale bands.
- 13.* E. olivaceus .- Penang and Sumatra.
- 14. Riopa albopunctata.—Penang.
 Exactly the same as in Bengal.
- 15. Podophis chalcides.—Sumatra.
- 16.* Gymnodactylus (? Cyrtodactylus) pulchellus.—Penang.
- Cyrtoductylus affinis.—Penang.
 Comp. J. A. S. B. vol. xxxix, pt. II, 1870, p. 167.
- Peripia mutilata, Wiegm., = Peronii, D. and B., testo Peters et Günther.—Penanq and Sumatra.
- 19. Hemidactylus frenatus.—Sumatra.
- Nycteridium platyurus, Schneid. = Schneideri.—Penang and Sumatra, very common.
 - All have less dark coloration than Himalayan or Khasi hill specimens, but are in other respects not distinguishable, Comp. J. A. S. B. xl, pt II, p. 103.
- 21. Gecko guttutus.—Penang.
 - 22. " stentor.—Penang.
 - 23. Ptychozoon homalocephalum.—Penang and Sumatra.
 - Bronchocela cristatella, Kuhl.—Sumatra, very common.
 All have 36 to 42 small equal scales in a lateral row.
 - 25. Draco volans, Linn.—Penang and Sumatra, very common.
 - 26.* , quinquefasciatus.—Penang.
 - 27.* " fimbriatus.—Penang.
 - 28. Hydrosaurus salvator.—Penang and Sumatra.

The light spots and bands are in young and in old males [ut least] bright yellow, not white. The species is also very common on all the Nicobar and Andaman islands.

29. Crocodilus porosus. +-Penang.

† The similarity of form and colour of the young of this species with equally large specimens of *C. Pondichertanus*, Gunther, is very striking. My collector recently brought several young specimens (12-14 inches) of the latter species from Arrakan, and when compared with equally large specimens of porosus, the former all have the snout, and also the tail, conspicuously shorter; all have only six rows of shields on the back, but there is an additional one on either external edge broken up into single shields. In porosus the outer row of shields on either side is complete, or continuous, and on the whole the dorsal shields appear to be smaller. In every other respect the young of both species are identical. I have not seen an adult of Pondicherianus, but it ought to be looked for in Arrakan. Both have a small shield on either anterior side of the

OPHIDIA.

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30.
     Typhlops nigroalbus.—Penang.
31.
              braminus .- Penang.
32.
     Cylindrophis rufus.—Penana.
33.* Calamaria Stahlknechti, n. sp.—Sumatra.
34.* Oxycalamus longiceps.—Penang.
35.* Simotes bicatenatus.—Sumatra and Penang.
36.*
              cruentatus, Theob.—Penang.
              catenifer, n. sp.—Penang and Jahore.
37.*
38.*
       Cyclophia tricolor.—Sumatra.
      Ablabes flaviceps, Günth .- Sumatra.
39.*
40.
     Compsosoma (Elaphis) melanurum.—Penang.
41.
                 radiatum .- Penang.
42.
     Ptyas korros.—Penang.
        " hexagonotus, (Cant.).—Penang.
43.
     Tropidonotus quincunctiatus.—Penang.
44.
45.
                  trianguligerus, Schleg.—Penang.
46.
                  vittatus .- Penang. (Günther's Colub. Snakes).
      Gonyosoma oxycephalum.—Penang.
47.*
      Dendrophis caudolineatus, Gray .- Penang and Sumatra.
48.*
49.
                 pictus .- Penang and Sumatra.
50.
     Tragops prasinus.—Penang and Sumatra.
51.
    Dipsas cynodon.-Penang.
            Drapiezii.—Snmatra. (Comp. Schlegel's Abbildungen).
52.
            dendrophila .- Penang.
53.
54.
     Chrysopelea ornata.—Penang and Sumatra.
55.
                rubescens .- Penang and Sumatra.
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neck, it being a rudiment, or rather probably the beginning, of the anterior nuchal plates.

Besides C. Pondicherianus, my collector brought among others the following species which I do not think had been previously recorded from Arrakan.

Callula pulchra.

Diplopelma carnaticum and D. Berdmorei.

Polypedates maculatus and P. quadrilineatus.

Hylarana erythraa and H. Tytleri. Both quite distinct species.

Riopa lineolata.

Tachydromus sexlineatus.

Hemidactylus (Doryura) Berdmorei.

Hinulia maculata. Also common on all the Andaman and Nicobar islands.

Lucodon aulicus, (black variety).

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56. Psammodynastes pulverulentus.—Penang.
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57. " pictus.—Sumatra.

(Colub. Snakes, p. 251). Exactly agreeing with Günther's description.

- 58. Lycodon aulicus.-Penang.
- 59.* Ophites subcinctus.—Sumatra.
- 60.* , albofuscus.—Sumatra.
- 61. Bungarus fasciatus.—Penang.
- 62. Adeniophis* (Callophis) intestinalis.—Penang.

 bivirgatus.—Penang and Sumatra.
- 63. Xenopeltis unicolor.—Sumatra.
- 64. Python reticulatus.—Penang.
- 65. Hypsirhina enhydris.—Penang.

All specimens have an almost continuous dark line along the middle of the lower side.

- 66. Hypsirhina plumbea. (Very variable).—Penang.
- 67.* , [Ferania] alternans.—Sumatra.
- 68. Fordonia unicolor.-Sumatra.

(The young are brownish olive with numerous dark dots).

- 69. Cerberus rhynchops.-Penang.
- 70. Homalopsis bucata.—Penang.
- 71. Hipistes hydrinus -Penang.
- 72. Hydrophis robustvs .- Sumatra.
- 73.* Trimeresurus Wagleri .- Penang and Sumatra.
- 74. , erythrurus.—Penang.

RANA FUSCA.

Comp. Anderson in P. Z. S. for 1871, p. 197.

Rufuos brown above, with a pale longitudinal dorsal streak, broad in front, narrow towards the posterior end; limbs above somewhat indistinctly variegated and banded with darker brown, posterior side of femora with closer and darker variegations. Lower side uniform whitish, except a few dark spots on the lower lip, but the front-end of the lower lip has a conspicuous white spot, as stated by Blyth.

The nostrils are much nearer the snout than the eye; the tympanum is smaller than the eye, but quite distinct in a nearly full grown specimen; skin above and at the sides of the belly with few scattered slightly enlarged tubercles; lower side perfectly smooth. The first and second fingers are slightly shorter than the third and fourth respectively; the second is shortest. The metatarsus has a single, inner, marginal, elongated tubercle. The first and fifth toes are fringed externally, but the tarsus has no fold. The toes are entirely webbed and their tips very distinctly swollen.

The length of the body equals the distance from the vent to half the length of the tarsus.

[•] See Peters in Monatsb. Berlin Akad., 1871, p. 579.

RANA LYMNOCHARIS, var. PULLA.

Comp. Stoliczka, Journ. A. S. B. vol. xxxix. pt II, 1870, p. 144.

Since the publication of my notes on this variety I have received two other specimens from Penang. The form of the body, the teeth, the structure and general coloration exactly agree with typical lymnocharis, except that in one of the specimens the four dark bands on the upper side of the femora are well marked and somewhat narrower than in the other, in which the coloration is typical. In both, the lower lip is spotted and the chin variegated with dusky. Neither of the specimens has a dorsal pale streak.

One of them measures, body 1.35 inch., which is only one tenth less than the distance between the vent and the metatarsal tubercle, the total of the hind-limb being 2 inch., while in a specimen of typical (half-webbed) lymnocharis of which the body is also only 1.35 inch., the distance between vent and metatarsal tubercle is 1.15 inch, but the total hind-limb is 2.2 inch. Thus in lymnocharis var. pulla the metatarsal bones are longer and the fourth toe on the contrary much shorter than in typical lymnocharis. In the former also, as previously noticed, the toes are nearly fully webbed, the web reaching to very near the tip of the third and fifth toes, but only to the base of the penultimate joint of the fourth toe.

The other specimen has the length of the body 1.3 inches, which is equal to the distance between the vent and the heel, and the total hind-limb is 2.17; thus very nearly equal to that of *lymnocharis*, only differing from it by the fuller webbing, the web reaching fully to the middle of the penultimate joint of the fourth toe. In this specimen also the tips of the toes are all remarkably swollen. All other characters are exactly as in typical *lymnocharis*.

These variations appear to me to indicate that they are progressive or undergoing certain changes according to the requirements of the animal, and that we are, therefore, not entitled to give them a specific value, unless they become permanent. I look upon this longer-limbed, shorter-tood and fuller-webbed hill form of *lymnocharis* as a small (pulla) local variety, possessing certain peculiarities, in exactly the same manner as the Andaman and Nicobar variety of the same species. (Comp. l. c. p. 142 et seq., and Proc. A. S. B. for June 1872, p. 102).

RANA PLICATELLA, n. sp. Pl. XI. Fig. 1.

Body moderately stout with longish hind-limbs and swollen tips to the toes.

Head large, snout obtuse, with the canthi rostales rounded; nostrils lateral, oval, somewhat directed upwards, nearer to the tip of the snout than to the eye; eye large, prominent, its longer diameter is slightly more than

the distance between it and the nostril, but it is equal to the width of the upper side between the eyes. Tympanum naked, as large as the eye.

Head smooth above, hinder half of the cyclids tuberculated; body above with about eight longitudinal somewhat interrupted folds, with numerous small tubercles between them; limbs also smooth above, with the exception of the posterior halves of the tibiæ, which are tubercular; chin in front with a few scattered, minute tubercles, a few others exist on the side of the belly, and the hinder part of the sacral region is densely studded with small plicated turbercles; the remainder of the under side is smooth.

The length of the body is very nearly equal to the distance between the vent and the middle of the tarsus; the fore limb is equal to the distance from the tympanum to the groin. The first finger is scarcely shorter than the third, the second and fourth are subequal. There is a slight fold on the inner lower edge of the tarsus, and one along the outer edge of the fifth toe. The tarsus has a single, inner, elongated, marginal tubercle. The toes are about three-quarter webbed, the web reaching on the fourth toe to scarcely beyond the base of the third-ultimate joint; on all the other toes it extends to the last joint, but it is deeply emarginate between all of them. The tips of all the toes are much swellen, the length of the fourth measured from the base of the tarsus is slightly less than half the length of the body.

Lower jaw with two fang-like projections directed inward. Tongue elongate, much broader towards the tip than at the base, terminating with two moderately sized projections. Vomerine teeth in two short oblique converging series. Sacral diapophyses not dilated.

Above, greenish brown, with a dark band from the nostril through the eye, continuing behind it; limbs with numerous transverse dark bands; they are somewhat ill-defined on the upper arm, on the lower arm there are three or four very short ones, six on the femur, five somewhat more distant ones on each tibia, three on the tarsus, one on metatarsus and a few more on the outer-side of the toes. The hinder sides of the femora are densely and rather minutely variegated with dark brown; a horse-shoe shaped yellow mark, open below, round the anus; folds on the tarsus and outer toe also yellowish; lips indistinctly variegated with pale and dusky; lower side uniform white, except on the tibiæ, and on the feet, which are speckled with dark.

The only species which in some respects resembles the present form is Rana porosissima, Steindachner, from Angola (Novara Amphibiens, p. 18, pl. I, figs. 9-13), but it differs in the coloration of the limbs, in the smaller size of the tympanum, smaller vomerine ridges of teeth, in having the apophyses on the lower jaw scarcely enlarged, the tips of the toes not swollen &c.

EUPREPES OLIVACEUS.

The young (body 1 to 1.5 and tail 1.5 to 2 inches) are very differently coloured from the old. The snout and headshields are olivaceous, the posterior edges of all the shields being blackish; the whole body and limbs are blackish brown, with numerous rather close, transverse, greenish white or yellow stripes; tail and the entire lower side yellowish white, or quite yellow. In the adolescent and some old ones the pale transverse bands exist as remnants in the shape of transverse series of spots, but most adults become entirely olivaceous, with only the edges of the eyelids bright yellow.

GYMNODACTYLUS PULCHELLUS.

In the descriptions of this species it is usually stated that there are six dark, white edged bands across the body, but properly speaking the sixth band is situated on the base of the tail. Further, it is stated that a fold of the skin exists along the side of the body. This is in reality not the case, at least not in live specimens, but the shield-like scales of the lower side are separated from the granular upper surface by a row of conspicuously enlarged granular scales; this row becomes strongly prominent in spirit specimens, and gives the appearance of a fold.

As regards the position of the femoral pores the species is intermediate between *Cyrtodactylus* and *Gymnodactylus*, the pores lying first in a longitudinal fold and then extending flatly on the femora. This instance shews that *Cyrtodactylus*, (as likewise the present species), should be looked upon merely as a section of *Gymnodactylus*.

DRACO QUINQUEFASCIATUS.

A single male specimen measures: head and body 3.5 inch, tail imperfect, apparently about 5 inches. The hind limb is contain d 1.33 times in the distance between it and the fore limb, the latter being somewhat shorter than the former. There are no enlarged tubercles on the head, but only a number of interspersed, slightly larger white scales at the sides of the neck, and a broad band of closer set ones across the occiput. The scales on the anterior part of the back are obsoletely keeled, on the posterior part they are perfectly smooth. On the wings scales are present along all the ribs, and in numerous longitudinal series on the basal half of the alar skin, while further on their number greatly diminishes, except again at the outer margin.

The specimen has only a very slight indication of a crest on the neck; the gular sack is very long and lanceolate, a dark band running at its posterior base across the lower neck. Chin dark spotted, like the body; tail also spotted at its base, but further on with brown bands. In all other respects the specimen agrees with Gray's characteristic description.

DRACO FIMBRIATUS.

Dumeril and Bibron, vol. iv, p. 448.—Gray, Lizards, p. 234.

A specimen from Penang exactly agrees with the one figured by Gray and Hardwicke in Illust. of Indian Zoology as D. abbreviatus from Singapore. The scales of the back are very small and almost quite smooth, with a series of larger ones on either side at the base of each wing. Günther (Rept. Brit. India, p. 123) says that no orbital or rather post-orbital, spine exists. This is a mistake, at least as far as male specimens are concerned. In these there are two very distinct post-orbital spines; they are well shewn in Gray and Hardwicke's figure. Dumeril and Bibron's minute description of the headshields from Javanese specimens also appears exactly to correspond with the structure of Singapore and Penang specimens.

General colour bronze brown; head, not including the nape, a zigzag undulating slightly variegated band across the neck, another across the shoulders, a third between the hind limbs, and a fourth, though less distinct one, across the middle of the body, pale bluish, a bluish black spot between the eyes; on the body are four irregular marks, each composed of a few blackish lines, and each enclosing along the middle of the back a somewhat elongated diamond-shaped figure.

Limbs with cross dark stripes, and bluish edges to all the front and hind sides. Wings above blackish with radiating bluish lines, below pale with a few scattered black spots. Tail banded with bronze and pale bluish. Chin variegated with dark; gular pouch tinged with blue and red, dusky at the base. Body below uniform yellowish white, with scattered bluish dusky spots, mostly conspicuous along the sides.

CALAMABIA STAHLKNECHTI, n. sp. Pl. XI. Fig. 2.

Body long, cylindrical, snout somewhat narrowly obtuse; total length 13.5 inches, of which the tail is 1.2 inch; rostral reaching to the upper surface of the head; frontals anteriorly narrower than posteriorly, laterally bent down, and in contact with first and second labials, the nasal being very small; occipital six-sided, with the anterior angle shorter and more obtuse than the posterior one, it is smaller than one occipital; each of the latter has an obtuse angle in front and behind, and both form an inwardly directed angle along the suture on either end; one præ- and one post-ocular; five upper labials, the third and fourth touch the orbit, the fifth is largest, in contact with the post-ocular and occipital; it is followed by a moderately sized shield which has quite the appearance of a sixth labial, and indeed the gape partially extends below this quasi-sixth labial; above this last extends a long temporal. Mental shield small; five lower labials; the first pair is the smallest, separated from each other, the fifth the largest. The first pair of chin-shields is largest, each being in contact with three labials and having a very

obtuse angle behind; the shields of the second pair are only about half the size of the first, entirely separated from each other by two scale-like shields following each other, and by two other somewhat larger shields from the first very large ventral. Scales smooth, in thirteen rows; ventrals 163, anal entire, subcaudals 22, the last single occupying the shortly pointed end of the tail.

Uniform irridescent brownish black above, the two outer series of scales on either side mostly white; upper labials spotted with yellow, the fifth labial being almost entirely yellow. Lower side, beginning a short distance from the throat, with two or sometimes three ventral shields alternately yellowish white and black, the black colour encroaching laterally upwards upon the yellowish white lateral bands, and being longitudinally connected along the edges of the ventrals and subcaudals; the latter have besides an interrupted blackish line along the middle, and the pale colour is tinged with vermilion. Possibly the red colour extended over the whole of the light coloration during the life of the snake.

The only specimen examined was sent to me with several other species by my friend Mr. Stahlknecht of Singapore; he collected the same near Dilli on Sumatra.

In general aspect the species resembles *C. Linnæi*, but differs essentially in several points of its structure. It also does not agree with any of the species more recently described by Bleeker and Edeling, or figured by Ján.

OXYCALAMUS LONGICEPS.

A single specimen of this rare snake was in the Penang collection; it measures seven inches of which the tail is one.

The following may be added to Cantor's and Günther's descriptions:

The rostral shield is of moderate size, reaching with its angle to the upper surface of the head; anterior frontals small, each about one-third the size of a posterior; the suture separating the two anterior frontals is only two-fifths of the length of the suture between the posterior frontals; vertical six sided, the sides touching the supraciliaries being parallel to each other; one supraciliary not quite as wide as half the width of the vertical; occipitals nearly double the length of the vertical, reaching down on either side to the postocular; nasal in a single shield.

Vent. 137, anal entire, subcaudals 29.

Uniform irridescent black above and below, many of the ventrals and subcaudals with paler posterior edges; a pale yellowish spot on the fifth upper labial and a second one on each side of the throat.

SIMOTES BICATENATUS.

In several specimens, the dark dorsal band is divided by a pale reddish

line. A young specimen has only one preocular, and only the upper smaller temporal is in contact with the postoculars.

SIMOTES CRUENTATUS.

Comp. Proceed A. S. B. for August, 1872, p. 145.

This species agrees in general aspect and coloration with S. bicatenatus, but it has only seventeen rows of scales. One specimen in the collection has a small portion of a labial detached, forming a second (lower) præocular; it has very few dark blotches on the anterior ventrals; only two black spots on the tail, one at the root, the other near the tip.

SIMOTES CATENIFER, n. sp. Pl. XI. Fig. 3.

The body is short, stout, moderately compressed, the head large, conspicuously truncate in front.

Rostral shield well reaching to the upper surface of the head; anterior frontals considerably smaller than the posterior ones, both bent down at the sides; superciliaries narrower anteriorly than posteriorly; vertical large, sixsided, with a very obtuse angle in front, somewhat converging sides, and with nearly a right angle behind; one occipital is about the same size as the vertical, each reaches down to the superior postocular and is rather broadly truncate behind. Nostril between an anterior large and a posterior somewhat smaller shield; loreal squarish; two præ-oculars, the upper is long, while the lower has the appearance of being only a small detached portion of the fourth labial; two postoculars; temporals 1 + 2 + pl., the last is somewhat irregular and scale-like, the first obliquely in contact with both postoculars. Eight, rarely nine, upper labials, the fourth and fifth under the orbit, sometimes a small portion of the fourth is detached, touching the orbit as a separate shield. Mental shield small; nine lower labials, those of the first pair form a suture; anterior pair of chin-shields largest, each in contact with four labials; second pair much smaller, and separated by other two somewhat smaller pairs following each other from the first ventral. Scales smooth, in nineteen rows; ventrals 178 to 205, distinctly angular at the sides; anal entire, moderately enlarged; subcaudals bifid, in 57 pairs.

The general coloration of the upper side is sandy brownish; head with the usual dark brown markings; the first band crosses the eyes and reaches forward to the rostral; the second ascends across the angles of the mouth to the outer median edge of the occipitals; the third is thick, arrow-shaped, anteriorly prolonged to between the eyes. Body with twelve or thirteen dark cross bands, each composed of four confluent spots, the two dorsal ones being larger and darker; tail with four or five cross bands. Between each two of these bands the scales, following alternately each other, are partially blackish, forming three undulating cross lines in each interspace. The sides

along the ventrals are checkered with blackish brown; lower labials with their hinder edges blackish. Lower side dusky yellowish, tinged with red which passes into vermilion on the posterior half; every second or third ventral has a quadrangular black spot at each of the outer edges, the interposed edges being white, and the spots are somewhat more distant on the ventrals than on the caudals.

The total length (in two specimens) is 9.5 inch., the tail being 1.75. I have received one specimen from Penang and Mr. Wood-Mason lately obtained a second one from Jahore, North of Singapore.

This is the fourth species of a small group of Simotes, all of which are closely allied to each other and all belong to the Malay or Chinese fauna: they agree in their small size, short and stout body, in the form of the head-shields and in coloration. S. Cochinchinensis, Günther, has twenty-one rows of scales round the body. S. brevicauda, Steindachner, (Novara Rept. p. 61, pl. iii, figs. 13—14) has, like catenifer, nineteen rows of scales, but the occipitals and oculars are in the former somewhat differently shaped, the markings on the head are also somewhat different, and there are no lateral spots on the ventrals; in every other respect both species almost perfectly agree, as far as I can judge from the figure and description, and if I had not obtained two perfectly like specimens of catenifer from different localitics, I would have hardly ventured to separate them as distinct. The fourth species is Ján's S. ancoralis, which has the black spots on the edges of the ventrals, but only seventeen rows of scales round the body and only one præ-ocular.

CYCLOPHIS TRICOLOR.

Schlegel, Phys. Serp. II, p. 187, pl. vii, figs. 16—18; idem, Dum. and Bibr.; Günther; Ján, Oph. Livr. 31, pl. vi, fig. 2.

One specimen measures 18.5 inches, of which the tail is 7 inch. Scales smooth, in fifteen rows, vent. 144, anal bifid, subcaudals 129. Greyish, or rather olivaceous, brown above, yellowish white below, a black streak from the nasal through the eye to the side of the neck, rapidly disappearing on the anterior part of the body. Each six-sided scale, above, has the anterior lateral margins pale, producing longitudinal zigzag pale lines; upper labials yellow; along the edges of the ventrals and sub-caudals runs an indistinct dusky line, and another interrupted one along the middle of the ventrals, these lines begin to appear a short distance from the neck, which is below and at the sides uniform yellowish.

The fine zigzag pale lines of the upper side are indicated in Ján's figure. Both in structure and coloration the Sumatra specimen agrees with Schlegel's figure and description, except that the head is a little more slender. This specimen had a large spider in the stomach. Schlegel's snake was

from Java and the species has, I think, not yet been recorded from anywhere else.

ABLABES FLAVICEPS, (var.), Günther.

Ann. and Mag. Nat. Hist. vol XVIII, 1866, p. 26, pl. vi, fig. B.

One specimen agrees well with Günther's description and figure of this snake, but it has nine upper labials, the second being replaced by two, so that the 4th, 5th and 6th labials enter the orbit. The hinder chin-shields are almost in immediate contact with the first well marked ventral. Total length 16.7 inch., of which the tail is 5.5 inch., being somewhat obtuse at the end; scales in 17 rows, one pree- and one or two post-oculars, 150 ventrals, anal bifid, 70 subcaudals.

Head yellow, somewhat tinged with brown in front, a straight black streak through the eye and a white one along the upper labials. The general colour of the upper side is brown, powdered with grey; a light blue band begins on each side of the neck, continuing on each side of the back, the colour gradually turning to grey, but both bands remain tolerably distinct to the tip of the tail. On the front part of the body each is marked with squarish black spots along the inner edge, further on the spots become smaller, alternate in position on the two sides, but are somewhat removed from the internal margins towards the middle line. Below, yellowish, all the ventrals, (except those on the neck), with narrow blackish hind edges about the middle of the body, almost meeting in the centre, but further on the black becomes more confined to the outer margins, and on the subcaudals it forms as rrated black band on either side, as in Ablabes melanocephalus, to which the present species bears a very strong resemblance. Dr. Günther mentions in his specimen only the presence of a black spot on either side of the ventrals.

GONYOSOMA OXYCEPHALUM.

A very large specimen, measuring about five feet, has the scales round the body in 27 series; it is sea-green, the tail strongly tinged with rubescent brown, the sutures of the scales being blackish; the dark streak on the side of the head is very indistinct; upper labials whitish green.

DENDROPHIS CAUDOLINEATUS.

Dr. Günther when noticing my paper on Penang Reptiles in the Zool. Record for 1870, says that I described his D. caudolineolatus (from Ceylon), as D. caudolineatus of Gray. I should have hardly expected such a brief dismissal of the consideration of all other points connected with the identification of this species. Dr. Günther appears to have noticed merely my statement regarding the thirteen rows of scales round the body, and to this one charac-

ter he seems to have sacrified everything else. Now the Penang species, of which I lately also received four beautifully preserved specimens from Sumatra, has only thirteen rows of scales. Cantor's description of the snake is admirable, and he gives also thirteen rows of scales. Dumeril and Bibron, when describing their *D. octolineatus*, also speak of only thirteen rows, and Ján (Ophid. Livr. 31, pl. II,) gives the same number of scales when figuring the species under Dum. and Bibron's name.

Thus the question to be determined is, whether Gray's type has thirteen or fifteen rows of scales round the body? If fifteen rows are present, we have to see whether we are entitled to regard this number as a normal or abnormal one in that particular specimen, that is, whether other specimens from the same locality have 13 or 15 rows of scales; for as far as other points of structure and coloration go, the Penang and Sumatra species is absolutely identical with Gray's caudolineatus. I have no Bornean specimens for comparison, so I can add nothing more towards the solution of the question.

The Ceylonese *D. caudolincolatus*, as far I can judge from the description and figure of it, differs in the structure of the præ-ocular, in the upper labials, and so very essentially in coloration, that I could not have thought of identifying the Penang caudolinealus with it.

OPHITES SUBCINCTUS.

One specimen measures eighteen inches, of which the tail is 3:25 inch. The general colour of the upper surface is black, slightly duller at the sides, dull olivaceous blackish below; front head above blackish brown; seventeen broad white rings round the body, the first on the neck, and four on the tail; the white of the rings is considerably more distinct on the anterior than on the posterior part of the body. The eight median rows of scales on the back are keeled; eight upper labials, regular on both sides.

OPRITES ALBOFUSCUS.

A remarkably slender snake, measuring 18.75 inches, of which the tail is 5.75 inch. It has seventeen rows of scales, all strongly keeled, the keels on the back being finely crenulated. The general structure exactly agrees with Günther's account of the species. The specimen has 241 ventrals, anal bifid, and 178 subcaudals, the last shield is single, very long and cylindrical.

The general colour is dark brown above, olivaceous white below; hind head and collar on neck very slightly olivaceous white tinged with yellow; body with twenty-six transverse white cross bands, some are imperfect, the intermediate brown bands of ground colour being first thrice, afterwards only twice as broad as the white ones. Tail with about twenty-six transverse white bands, several of them succeeding each other being often

confluent along the middle line, and all are about equally broad as the brown bands separating them; towards the tip of the tail the light coloration prevails and almost entirely suppresses the dark one.

Mr. Stahlknecht obtained only a single specimen near Dilli on Sumatra-Duneril and Bibron also described a specimen from Sumatra; another one is reported by Dr. (fünther as having been brought from Malabar, but as it was bought from a dealer, the locality is not considered reliable.

HIPSTRIINA [FERANIA] ALTERNANS, Reuss.

Eurostus alternans, apud Dum. and Bib., Herp. Gen., VII, p. 957.

Homolopsis decussata, Schlegel.—Hipsishina alternans apud Ján, Ophid, Livr. 30 pl. vi, figs. 1 and 2.

One specimen measures: total length 8:25 inches, the tail being one inch. It has two anterior frontals, the first scarcely half as large as the posterior, vertical six-sided, much smaller than one occipital; one loreal, one præ-ocular, two post-oculars; seven upper labials, the fourth under the orbit; the two first lower labials are in contact; two pairs of chin-shields, the first forms a suture, the shields of the second pair are much smaller, diverging and with their upper pointed ends lying between the first chin-shields and the labials. There are twenty-six rows of scales immediately behind the head, twenty-two round the neck, below interrupted by the second ventral, and nineteen round the middle of the body, ventrals 157, anal bifid, subcaudals thirty-four, the first five entire, the last conical.

General colour brown; head, above, anteriorly with a few pale spots; back with narrow pale (yellowish) cross bands: the first passes over the hindedges of the occipitals and is laterally bipartite, the next four are simple and complete, the following after these mostly interrupted along the centre, and after the middle of the body the bands become reduced to indistinct lateral spots. The sides of the body are marked with a series of pale yellow cross-bars, more than one scale broad, and are separated by equally broad bands of the general brown coloration; the lateral pale bands more or less encroach upon the ventrals, but the general colour of these latter is pale brown. Chin and upper labials spotted with yellow.

This coloration slightly differs in minor details from that given by Ján, but it agrees with it in all essential points.

The larger size of the occipitals as compared with the vertical, the smaller number of upper labials and of the scales round the middle of the body, and the coloration readily distinguish the present species from F. Sieboldi.*

Günther, in Ann. and Mag. N. H., 1866, xviii, p. 28 and in Zool. Rec. for 1868 says, that Ján figured F. Sieboldi as Hypsirhina Bocourti (Iconograph, Livr. 28, pl. v, fig. 2). Ján's H. Bocourti has apparently only 23 or 25 rows of scales round the body,

TRIMERESURUS WAGLERI.

Fresh specimens are black above, with numerous spots on top of head, the superciliary edges, both lips, numerous narrow cross bands and the whole of the lower side bright golden yellow with a greenish reflection during life; the stripe from the nostril to below the eye, continuing above the angle of the mouth, one stripe on each side along the margins of the labials, and all the other light spots on the back, but particularly at the sides, are sea-green, more or less tinged with yellow.

Notes on the indian species of Thelyphonus, by Dr. F. Stoliczka.

(Received 23rd February, 1873, read 5th March, 1873.)

[With plate XII.]

Towards the end of last year, a monograph of the genus *Thelyphonus* appeared in the September number of the Annals and Magazine of Natural History. The author of the paper, Mr. A. G. Butler, seems to have sifted well the materials of the national collection in the British Museum, but whether he has succeeded in his determinations of known, described and figured, species, is a question on which I may be permitted to say a few words. I will not unnecessarily transgress the field of my observations, and will chiefly confine my remarks to the Indian representatives of the genus.

I had for some little time devoted attention to these Arachnoids, and it has been my intention to publish a detailed monograph of the Indian Thelyphoni, together with an account of their anatomy,* notes on their habits, propagation, development, etc., all points about which our present knowledge is as yet very imperfect. Unfortunately, I have just at the present neither the time nor the materials which would justify me to treat satisfactorily with this subject, and I must leave it, therefore, for a subsequent communication. One of the chief objects of the accompanying notes is to draw the attention to certain discrepancies, or perhaps insufficiencies, in Mr. Butler's determinations of a few of the Indian Thelyphoni.

the coloration is somewhat similar to that of *F. alternans*, the occipitals are much longer than the vertical, and there is only one anterior frontal, this, however, is also said to exist in an old specimen of *Sieboldi* from Siam. Still I am not certain that Günther's suggested identity of the two snakes will be confirmed.

Ján does not acknowledge the distinctness of Ferania from Hipsirhina, and if F. Sieboldi has occasionally only one anterior frontal, the principal reason for keeping the two genera as distinct no doubt looses its validity.

^{*} As compared with that of the Scorpions.

Lucas' account of the external anatomy of *Thelyphonus* is the only reliable one which we as yet possess. Short as it is, it clearly points out the great relation of the genus to *Phrynus*, and its essential difference from the scorpions.

As regards general distribution, I may say, that on the whole, particularly when compared with scorpions, the *Thelyphoni* are rare. I have only observed two life species, *T. scabrinus* and *T.* (conf.) angustus. Both were found at the foot of the Sikkim hills in damp places under the bark of old trees. They are crepuscular or nocturnal animals. When disturbed during the day, they try rapidly to escape, slightly raising themselves on their feet, holding up the cheliceres ready for defence, and erecting their caudal seta. Thus they progress very fast and soon disappear in any crevice or hole to which they find easiest access. In the evening they progress very quietly, moving their antennular first pair of feet in advance. When disturbed they stretch out these feet in a curve, and close their cheliceres over the mouth as a kind of protection, lying at the same time quite flat and motionless. I saw *T. scabrinus* issuing a peculiar fluid from two internal piloric appendages on each side of the anus, but the fluid did not have any offensive odour.

Mr. Peal of Sibsagur (Assam), who is an able observer and is always ready to give assistance on any subject connected with natural history, writes to me also that the *Thelyphoni* are generally found underneath the bark of decayed wood in groups, rarely singly. When first uncovered they (generally) lie perdu and try to pass as some smudge or fungus; lying close and flat, the legs gathered well together and the cheliceres folded in and closed in front of the mouth. On being disturbed they generally start up, throw out and up their cheliceres, gaping wide, erect the tail and invert it so as to feel if possible any object above them; sometimes they throw it quite over between the cheliceres. The first pair of feet, he says, seems to act more as feelers them as organs of progression. These animals seem to move either very slowly or very fast. In raising any fragment offered, they hold it aloft and stand well upon their legs, at least for a time.

Mr. Butler proposed to group the *Thelyphoni* in three sections, according to the number of denticles on the upper antero-interior edge of the second joint of the cheliceres. This is apparently a character of great importance, but like all others it is not without variation. I found that the relative proportions of the joints, particularly of the second, third and fourth, are almost more constant than the denticles alluded to. The form of the large spine on the fourth joint, and in fact the total length and ornamentation of the surface of the cheliceres, and the proportionate length of the feet are at least equally important in distinguishing the species.

The next useful character lies in the form of the anterior part of the thorax, whether it is depressed or rounded, and whether the anterior and lateral eyes are connected by a ridge or not. Next in importance is the form of the first abdominal shield. The length of the tarsi on the first pair of feet is also tolerably constant, and so is the form of the mandibles, but these, as a rule, are difficult to examine.

All other characters relating to the form of the body have a comparatively limited value; the single parts are very uniformly constructed in the different species, and are at the same time very much liable to variation. Thus the width of the abdomen is very variable, (most likely according to the different sexes), and so is the length of the abdominal seta, as regards number and size of the separate joints, etc.

Turning now to the sections, distinguished by Mr. Butler, there are some discrepancies to be noticed in the species referred to them by the author. In the first section, with five denticles on the second joint of the cheliceres, we find among others:

T. Brasilianus. I count in Koch's original figure of the species at least seven, almost equal, denticles on the antero-interior edge. Their number, it is true, is not mentioned in the description, but if Koch's figure has been found to be incorrect, the correction should have been noticed. I am not aware that anybody has pointed out an inaccuracy in Koch's figure.

Guerin's *T. caudatus* (in his edition of the Régne animale) is identified with *T. Antillanus* of Koch. This is, I think, hardly admissible. Guerin's figure represents a species with comparatively shorter limbs and with the third joint of the cheliceres smooth on the upper surface and much longer, than a comparison of Koch's figure of *T. Antillanus* can bear out. The only reason for the identification of the two figures is, I think, Guerin's note that *T. caudatus* is from the Antilles, but whether that particular specimen was from the Antilles is an other question.

The identification of T. Assumensis with T. ruftmanus of Lucas is entirely inadmissible, as I shall point out in detail further on (see p. 134).

- T. proscorpio of Lattreille is an altogether doubtful species, and even should Koch's definition of the presumed same species be adopted, there is no sufficient reason for considering it as identical with T. caudatus of Lucas. I shall refer to this question again in the description of T. scabrinus (see p. 133).
- T. Linganus. Koch's original figure gives six denticles on the second joint of the cheliceres, but does not refer to that number in the text. Is the figure incorrect in that respect?

Koch's T. rufipes is clearly not the same species as the one originally described by Lucas under the same name. The cheliceres and the limbs are in proportion to the body much longer in the former than in the latter; and, besides that, Koch's species has a slight central keel on the upper side of the

abdominal segments, and on the lower side the first segment is centrally grooved; neither of these characters are mentioned by Lucas, though when describing the respective parts he could hardly have overlooked these prominent characters I consider Koch's rufipes as the same which he describes under the name of proscorpio; for the differences which he notices as distinguishing the two are decidedly of no specific value.

In the second group with two denticles on the second joint of the cheliceres, Butler describes *T. formosus*. My specimen of evidently the same species has six denticles of which, however, only two are well marked.

In the third division, including species with six well developed denticles, one is referred to under the old name of *T. caudatus*. I shall attempt to trace the history of this name when speaking of *T. indicus*, (n. sp.), which is possibly the same species as the one referred to by Butler from Madras and Bengal under the name of *T. caudatus*.

In addition to the three sections, I have one species, T. Beddomei, from the Anamallies, with seven denticles on the upper edge of the second joint. Among the very large number of specimens of T. scabrinus, (n. sp.), I found instances in which the second left joint has occasionally six denticles, while the right one had constantly only five. This clearly shews that the sections solely based upon the character, selected by Mr. Butler, can have only a very limited use.

Thus far I have commented upon Mr. Butler's determinations, but it must be understood that in the above instances my observations are mainly based upon descriptions and figures; for I have no other but Indian specimens for comparison. If those descriptions and figures were found to be incorrect, or not reliable, the mistakes had first to be pointed out and corrected, before a determination, based upon them, was admitted or rejected.

Finally, before entering upon the specific details, I must briefly allude to the geographical distribution of the genus. This distribution extends from South America and the West Indies northwards to Mexico, in a westerly direction through the ocean of little islands to the Philippines, touching North Australia, and stretching North as far as Corea, China and through the Malay Peninsula to Burma and India, where we meet with most of the species in the provinces of Assam and Sikkim, more rarely in Bengal and in South India, including Ceylon, all countries which have a marked admixture of Malayan types. No species is known to occur westward of the country alluded to, not even in Eastern Africa, as far as we know at present. This distribution resembles in so many respects that of the Passalide, that I shall again return to its discussion at an early opportunity.

The species which I have to notice from India, are:

- T. scabrinus, n. sp.—Cachar, Khasi hills, Assam, Sikkim.
- T. Assamensis, Stol.—Assam, Sikkim. 2.
- T. (conf.) angustus, Lucas.—Sikkim, Martaban (Moulmein), and 3. Penang.
 - T. formosus, Butler.—Martaban (near Moulmein). 4.
- T. indicus, n. sp.—South India, W. Bengal, and Jahore, North of 5. Singapore.
 - T. Beddomei, n. sp.—South India (Anamallies).

I will make my descriptions as complete* as possible, and will not only give figures of single parts of the body, but also of the perfect specimens, in order to facilitate the determination by identification and not by guess. Figures of single parts are undoubtedly very useful, but they are not sufficient; they do not convey an exact idea of the relative proportions of all the parts of the body, and without paying due regard to these, a really reliable determination of Thelyphoni is in my opinion impossible.

1. THELYPHONUS SCABRINUS, n. sp. Pl. XII. Fig. 1.

The whole upper surface granular; length t of the five terminal joints of the cheliceres equalling the length of the first eight abdominal segments; the length of last pair of feet equals exactly, or very nearly, the total length of the cephalothorax and abdomen; second joint of the cheliceres with five spines, third with a spine on the upper and lower inner edge, and equal in length to the fourth joint; a sharp upper ridge connecting the central and lateral eyes; first lower segment of abdomen of moderate size, depressed, with a broadly convex posterior edge.

Hab.—Sikkim, Assam, Garo-, Khasi- and Cachar- hills.

The cephalothorax is slightly convex, with the anterior ocular portion somewhat higher, but on the whole depressed and flattened, roundly obtuse in front. The two anterior blackish eyes are separated by a moderately levated . smooth tubercle; from its anterior edge proceeds a sharp ridge curving outward, and running along the upper edge to the three lateral eyes, which are pale yellow. The ocular portion is more densely and somewhat more coarsely granular than the thoracic one; the former has a longitudinal central groove, I and parallel to it an indistinct elevation on either side, placed nearer

- I know that few would take the trouble of reading them on account of their length, but everybody, who has attempted to determine Arachnoids, will know that a description, unless fully detailed, is worthless for an accurate determination.
- + This length is of course measured as far as the joints can be opened without disconnecting the articulation; it is not the aggregate length of the separate joints.
- I I shall speak of this as the cephalic groove, and of the one on the posterior half of the cephalothorax as the thoracic groove and the lateral thoracic depressions.

to the margins; the latter has also a longitudinal groove which is most depressed in the centre; anteriorly from the central depression proceed two lateral grooves to the postocular depressions, and from the centre itself two on either side towards the margin. The sternum is triangular, obtuse in front.

The abdomen is moderately depressed, very elongately ovate, across the middle about one-twelfth of an inch broader than the thorax; granular above, with the posterior segmental edges crenulated; the muscular points* are round and well marked on the second to eighth segment, the three last segments are mostly smooth, the last joint being roundly compressed towards the upper end, with a small vertical and eliptical gland on either side. Below, the first nine segments are finely scrobiculately punctated at the sides, and smooth along the centre; the first joint is largest, equalling in length the three last ones, with the central portion of the posterior edge somewhat convexly produced; the second joint is barely curved at the edge and the third, like the succeeding, quite straight. The muscular impressions are clongate and well marked on the fourth to seventh joints, but a little less distinct and more approximate on the first and second joints. The caudal seta very nearly equals in length the whole of the body, it is always peculiarly attenuated towards the end, and all the joints are more or less hairy. The length of the joints and their number is very variable; the first is as usually the longest, the succeeding either gradually decrease in length, or some of them situated near the middle are longer than the rest.

The cheliceres may be regarded as of proportionate size to the body. The two first joints have each a strong spine in front, provided with a sharp joint and a small denticle on the inner side. The second joint has the upper side depressed, anteriorly moderately produced, with three small denticles on the inner edge, and two larger ones on the anterior one; the outermost larger denticle is somewhat more distant from its preceding one, than any of the others from among each other, but all are directed forward and inward; the inner concave side of this joint is coarsely granular, and the lower anterior corner has two denticles, of which the terminal one is the larger. The third joint on the upper side is equal in length to the second, and laterally along the middle to the fourth; it always has a small denticle on the inner anterior corner, and a larger one in front of the middle of the lower edge. The anterior process of the fourth joint equals in length the fifth joint, it is depressed, smoothish, with a rapidly contracted sharp point and serrated edges, the posterior serration being slightly coarser

^{*} These points or depressions are very often called stigmatic points, but they have nothing in common with the stigmata, which lie under the edge of the first lower abdominal segment, and are not externally visible; the depressions are merely places of the inner attachment of the muscular bundles which connect the upper chitinous integument with the lower one.

and beginning with two somewhat larger denticles at the base of the process; this fourth joint also has a minute denticle on the lower anterior corner. The fifth joint is invariably conspicuously shorter and thinner than the fourth, anteriorly with a strong depressed, sharply pointed process which is somewhat more coarsely serrated posteriorly than anteriorly; the lower anterior corner of this joint has two denticles, the anterior of which is somewhat stronger than the corresponding denticle of the preceding joint. The sixth joint, or movable claw, is somewhat longer than the process of the fifth, slightly inwardly curved, sharply pointed, above and below with a finely serrated edge, internally on the concave side with a smooth ridge, and two equally smooth ones are externally on the convex side.

The first pair of feet are thin; the terminal eight tarsal joints are shorter than the preceding metatarsal one. The coxal and femoral joints of the three other pair of feet are thick, depressed, very densely and finely granular.

Colours. Full grown specimens are above brown, slightly darker on the cephalic portion of the thorax and on the cheliceres, except near their ends; all the feet from their tibial joints to the end are red, and each joint of the three posterior pairs has near its terminal upper edge a black dot; the last joint of the maxillæ, the ocular tubercle and the claws are black. On the lower side the cheliceres, the prosternum, the abdomen are more or less dark brown, the coxæ of the feet and the sternum are yellowish brown and the feet reddish brown.

The following are the dimensions of a specimen of very nearly the same size as the one figured by Koch as *T. proscorpio*.

Total length of cephalothorax and abdomen,			
Length	of cephalothorax,	13.6	19
"	" abdomen, including the three terminal joints,	23.	,,
,,	" cheliceres, measured above, without basal joint,	14.5	"
20	" first pair of feet, excluding the basal or coxal joint,	44.	,,
"	, second ditto,	25.	,,
23	, third ditto,		,,
99	" fourth ditto,	36.	,,
29	,, abdominal seta, ditto,	86.	*

In young specimens (with a total length of about 20 mm.) the abdomen is often slightly longer in proportion to the length of the cheliceres, but there is not the least difference in structure. The body and cheliceres are olivaceous brown, the process of the fourth joint, the whole of the fifth and sixth joints of the cheliceres red; coxal and femoral joints of all feet olivaceous, the remaining joints and the seta yellowish red. On the lower side, the basal joint of cheliceres is pale brown with the spinal processes red, the three following olivaceous brown, the two terminal red; prosternum

olive brown, coxe and sternum yellowish brown, abdomen pale brown, feet of the same colour as on the upper side.

The species grows to a large size: the largest specimen from Sikkim has the total length of cephalothorax and abdomen 50 mm.

In Sikkim the species is found from 1000 to about 4000 feet in damp places under wood, more rarely under stones. It is the most common of all the Indian *Thelyphoni*. I have examined about forty specimens of all sizes from 20 to 50 mm., and all exactly agree in structure.

It seems very improbable (judging from the localities recorded by Mr. Butler) that there should be no specimens of this species in the British Museum, but I am not certain whether Mr. Butler refers to it under T. rufimanus or proscorpio. He must have thought it not worth while reading my description and comparing my figure of T. Assamensis, or else he could not have referred it to the present species.

The original name T. proscorpio of Lattreille (Gen. Crust. et Insect., 1806, p. 130) was, strictly speaking, proposed for Linné's Phalanqium caudalum. In spite of the numerous references to figures in various old books, it is entirely impossible to trace the species which Latreille had in view The name would have had to be entirely ignored, but for its timely rescue by Koch who figures a Javanese species under Latreille's name, giving the same synonyms, (Arachniden, Vol X, p. 26, pl. 333, fig 771). Judging from mere figures, we are, I think, justified to regard the species, delineated by Koch, as different from Lucas' Th. caudatus (to which I shall refer further on). Koch's proscorpio would appear to have the joints of the cheliceres shorter and thicker, the fifth much stronger than the fourth, (while the reverse is observed in Lucas' figure), the centre of the anterior upper abdominal joints keeled, the first, lower abdominal joint very large and with a longitudinal groove. I hardly think that Lucas could have overlooked the last character, when describing the first lower abdominal joint; and besides that in his species he particularly refers to a separate small spine preceding the great spinal process on the fourth joint of the cheliceres; it is indicated in his figure, but not a trace of it is to be seen in Koch's figure. For these reasons, it seems to me clear that we have to consider Lattreille's re-established Th. proscorpio as distinct from Linne's re-established T. caudatus.

Butler also doubtfully refers Lucas' T. angustus to his compound mixture of Th. proscorpio, but with still less reason, as I shall presently shew.

2. Thelyphonus Assamensis, Stol. Pl. XII. Fig. 2.

T. Assamensis, Journ. A. S. B. Vol. xxxviii, Pt. II, 1869, p. 205, pl. xix, fig. 1.

The whole upper surface granular; the length of the five terminal joints of the cheliceres fully equals the first nine abdominal segments; the last foot is

longer than the cephalothorax and abdomen together; second joint of cheliceres with five subequal spines, four being on the inner, one somewhat more distant on the upper anterior edge; third joint with a single strong spine on the lower median edge, it is longer and slenderer than the fourth joint, whose anterior process is long, subcylindrical, smooth posteriorly, denticulate on the antero-interior edge; a sharp denticulate ridge connects the central with each group of lateral eyes; first lower abdominal segment depressed, particularly in the middle, with the posterior edge convexly produced.

Hab.—Assam and Sikkim. The species is much rarer than the previous. It will be seen from this abbreviated characteristic that the species is very closely allied to the previous, but after having examined several specimens of each, exactly agreeing with each other, I think they must be looked upon as two distinct species. I have already given a detailed description of the present one.

In size and coloration it almost exactly agrees with T. scabrinus, but is slightly more depressed, the cheliceres are somewhat more slender and longer. The spines on the second joint are subequal, four on the inner edge, and one distant one on the upper edge; the form of the third joint and the process on the fourth differ essentially, as may be readily seen by a comparison of the enlarged figures of the respective cheliceres. The feet are also proportionately longer than in T. scabrinus; the eight tarsal joints on the first pair equal in length their preceding metatarsus. Internally along each group of lateral eyes are two imperfect ridges of granules somewhat parallel to the central cephalic groove.

As regards general form and proportional size of the joints of the cheliceres *T. Assamensis* is also closely allied to *T. caudatus*, as emended by Lucas, but the denticles on the second joint are very different.

Butler (loc. cit. p. 202) considers T. Assamensis as the adult of T. rufimanus of Lucas. If such identifications were admitted, we might better give up the idea of distinguishing at all species of Thelyphoni; a superficial comparison of the respective figures will shew that the cheliceres and limbs of T. Assamensis are proportionally very much longer, than could possibly be attributed to a change in age. Lucas particularly refers to the shortness of the cheliceres* in his description of T. rufimanus, their third joint is said to have no spines whatever; the first lower abdominal segment is stated to be very large. Besides that it appears to me, judging from the figure, that there is in Lucas' species no sharp ridge between the central eyes.

- 3. THELYPHONUS (conf.) ANGUSTUS, Lucas. Pl. XII. Fig. 3.
- ? T. angustus, Lucas, Guerin's Mag. de Zool. for 1885, pl. 10, fig 3.

Cephalothorax and abdomen long and slender, finely granular above; cheliceres in young almost entirely smooth, in old specimens with the exception of

the second joint mostly smooth, the length of the five terminal joints is about equal to that of the first six abdominal segments, which is slightly more than the length of the cephalothorax; the length of one of the last feet, or that of the caudal seta, is considerably less than that of the cephalothorax and abdomen together; cephalic portion of thorax at the sides between the central and lateral eyes rounded; second joint of cheliceres with five denticles, of which the two uppermost are subequal and larger than the three others; third joint not longer than the fourth, with a denticle on both the upper and lower inner edges; first lower abdominal segment depressed, with the posterior central edge somewhat narrowly produced.

Hab .- Penang, Moulmein, and Pankabari (Sikkim).

I have six specimens for examination, two from each locality; they all agree in the above characters, and appear to me to be referable to Lucas's species.

The slenderness of the body and the shortness of the cheliceres are very striking distinctions as compared with the two preceding species. The cephalothorax is only about half the total length of the abdomen, with the anterior end somewhat narrowly rounded, convex above, the cephalic portion being more distinctly, though still very finely, granular than the thoracic one; the median ocular tubercle is low, rounded, smooth; the central eyes small, black; the sides between them and the lateral amber-coloured eyes founded, with a slight longitudinal elevation above the latter. The cephalic groove is distinct, beginning a short distance behind the ocular tubercle. The central thoracic impression is rather large, with a very fine groove passing through it; lateral impressions rather indistinct. Prosternum on the face obtusely keeled with a short anterior broad point; sternum ovately subtriangular, smooth, anteriorly subtruncate.

The first nine abdominal shields are on the upper side very finely granulated, with slightly raised lateral and posterior edges. The muscular rounded pits are well marked from the second to the eight segment. The lateral kin is densely and very finely punctated and scrobiculate. The first segment has the middle of the posterior edge narrowly produced, and its length laterally is equal to that of the two succeeding ones, all three are broadly laterally punctated, smooth in the middle, while the other segments are mostly smooth, with only a few fine scattered dots.

The caudal seta is always shorter than the total body; it is distinctly hairy in young specimens, but the hairs easily wear off in adults.

The cheliceres are almost quite smooth in young specimens, while in adults the second joint is on the upper side densely punctated, the other joints are very sparingly covered with hair, these becoming, however, more numerous towards the tips. The first joint is flattened, with two anterior diverging processes, each terminated by a short spine, which has the appearance as if it had

been set into the abbreviated end of the process. The remaining five joints are in form, relative size and denticulations, exactly like those of *Th. scabrinus* on a small scale, with the single exception that, as already observed, they are mostly smooth. The eight tarsi of the first attenuated pair of feet are considerably shorter than the preceding metatarsus. The remaining feet have the femoral joints depressed and finely granular above.

Colour of adult, above, blackish brown, somewhat less pure on the abdomen and with the three terminal joints of the cheliceres reddish brown, coxal and femoral joints of all feet olivaceous brown, remaining joints bright red; lower side entirely reddish brown, only the second and third joints of the cheliceres, the points or denticles of all the other joints, the prosternum, the femora, the external margins of the abdominal segments, including nearly the whole of the four terminal ones, are blackish; the shades of brown, however, slightly differ: the last joint of the cheliceres being rather bright red, the first pair of feet reddish brown, the coxæ and sternum yellowish brown and the abdomen chesnut brown; the seta is reddish brown.

Younger specimens have all the upper dark brown as well as the lower reddish coloration paler, but the ends of the cheliceres are bright red and the feet and caudal seta yellowish red. In the four specimens from Sikkim and Penang the femoral joints of the first pair of feet are dark, in the two specimens from Moulmein the whole of these feet are reddish brown.

The largest specimen from Sikkim measures :-Total length (excluding the seta), m.m. Length of five terminal joints of cheliceres, 11 ,, cephalothorax,..... 10 " abdomen, 20 " first pair of feet (excluding the coxa),..... 26 ,, second, 25-5 " fourth, " caudal seta,

A comparison of my figures and description of the present species with those of Lucas (loc. cit.) will show, that the form of the body, the proportions of the different joints and the coloration agree as closely as could be expected, so much so that I can scarcely doubt the identity of the two. There is only one point in Lucas' description which, although in itself apparently of no very great importance, is contradictory to what can be observed in my specimens. Lucas says that the third joint of the cheliceres is smooth on the upper inner edge, and provided with a spine only on the lower edge, while in all my specimens there is a distinct though very small spine on the upper edge and a somewhat larger one on the lower. As Lucas' type is in the Paris Museum, it will be comparatively easy to settle this point by a re-examination of the specimen.

4. THELYPHONUS FORMOSUS, Butler. Pl. XII. Fig. 4.

Ann. and Mag. nat. hist. 1872, vol. x, p. 203, pl. xiii, fig. 4.

Upper side of body finely granular, of cheliceres nearly smooth, length of the five terminal joints of cheliceres very nearly equalling that of the first nine abdominal segments; second joint of cheliceres on the upper anterior edge with six very small denticles, of which only the two middle ones are pointed, fourth and fifth joints more swollen than the two preceding ones; edge between the central and lateral eyes swollen, rounded, not carinated; length of one of the last feet almost exactly equals the cephalothorax and the abdomen; first lower abdominal segment very large, with the median posterior edge produced, but still truncated, and depressed.

Hab.—Moulmein, (in the Martaban province).

The cephalothorax is comparatively small, its length being only slightly more than half that of the abdomen; it is convex, anteriorly somewhat narrowly rounded, with the cephalic portion behind the ocular tubercle transversely rugose, further on rugosely granular, the granulation being considerably stronger than on the thoracic portion. Ocular tubercle and central eyes small, black. Cephalic groove with slightly raised margins. Edges beginning a short distance behind the central eyes and extending to the laterals broadly rounded and swollen. Median and lateral thoracic grooves and impressions narrow, but distinct and shining smooth. Prosternum narrow, subcarinate; the sternum rather elongately trigonal, anteriorly obtusely rounded, with the sides posteriorly sloping.

The first nine upper abdominal segments very finely granular, with crenulated posterior margins; the muscular rounded pits are distinct on the first eight segments, the three last narrow segments are smooth. Sides punctured, and with small scattered elongated tubercles, of which a median row slightly exceeds the others in size. On the lower side the two first segments are strongly rugose at the sides, the others only punctated, the median portions being smooth, except on the narrow second and third segments on which the punctuation extend almost to the centre. The first segment is largest, with the posterior part centrally produced, but with the edge truncate. The first pair of feet is entirely smooth, the second and third have the femoral joints, and the last all the joints, scrobiculately punctated, the punctuation extending even to the hinder sides of the coxe.

The cheliceres are sparely hairy, except on the inner sides and near the tip. Each first joint has anteriorly a strong sharply pointed process. The second joint has on the upper margin six denticles, four being on the inner edge,—the two lower obtuse, the two upper pointed and longer,—the fifth and sixth are on the anterior edge, both very small and indistinct, the last is distant from the rest; the anterior half of the joint is transversely rugose; the lower anterior edge has two subequal very small denticles. The third

joint is slender, slightly longer than the second, with numerous sharp granules on the upper rounded inner edge, and one strong spine in the middle of the lower edge. The fourth joint is not longer but considerably thicker than the third, with a long, inner, rather equally slender, smooth, anterior process, with its termination shortly bifid and internally provided with a compressed tubercle. The fifth joint is equal in length to the preceding, but again more inflated, with a short and broad anterior process, sharply serrated on both edges. The sixth joint is moderately curved, externally grooved and with the upper and lower edges finely serrated, and internally pilose.

The length of the eight tarsi of the first pair of feet is less than that of the metatarsus. The femora of the other feet are moderately thickened and depressed.

Colours. Above,—cheliceres and cephalic thorax brilliantly shining blackish brown, remainder of cephalothorax and abdomen dull blackish; maxillæ with the exception of their tips and all feet bright reddish chesnut; caudal seta somewhat deeper red; sides of abdomen fulvous brown. Below,—cheliceres on the first joint dark brown, remaining joint blackish brown, sternum, coxæ and feet reddish chesnut, abdomen darker chesnut.

I have some years ago collected this species near Moulmein, wherefrom Butler's type was received. If the second joint of the cheliceres of the type specimen has no indication of any other but two denticles, the occurrence must be looked upon as an accidental variation. The form of the body and of the cheliceres is so characteristic, that the species cannot be easily mistaken with any other. The following are the dimensions of an apparently full grown specimen:—

Total length of cephalothorax and abdomen,			
Length	of the first terminal five joints of chelicores,	13.5 "	,,
,,	" cephalothorax,	9. "	,,
,,	" abdomen,		
1)	" first pair of legs (without coxw),	285 "	"
,,	" second,	15.5 ,,	,,
,,	,, third,	16.5 "	,,
,,,	" fourth,	21.5 "	"
12	" caudal eta,		

5. THELYPHONUS INDICUS, n. sp. Pl. XII. Fig. 5. An Thel. caudatus auctorum!

Upper side very finely granular; the first nine abdominal segments, centrally, with a partial, very fine carina; cheliceres mostly smooth, except on the second and third joints which are densely punctated; the length of the five terminal joints of the cheliceres equals that of the first seven or seven and a half abdominal segments; the length of one of the last pair of feet is very nearly equal to that of the cephalothorax and abdomen taken together;

a short sharp edge in front of the lateral eyes, not continuing to the central eyes; second joint of cheliceres with six small, subequal denticles, third not longer than the fourth, with a little spine above and below; first lower abdominal segment very large, convex, centrally grooved.

Hab.—South India, Western Bengal, and the Malay Peninsula.

The cephalothorax is rather obtusely rounded, with the perpendicular front side perfectly smooth; the ocular tubercle is also smooth and very high, the circumference round each black central eye being depressed. the ocular tubercle passes in a curve a rounded edge below the central eye, and after a short distance from this one joins a thin, but sharp and finely serrated, ridge which continues to the lateral eyes; the latter are pale amber yellow. The upper side of the cephalic thorax is flattened, indistinctly granularly rugose, with a rather small central groove. The thoracic portion is very finely granular and most minutely punctated, with the central depressions distinct, but the lateral ones ill-defined. The abdomen is one sixth broader than the thorax, very finely granular, with a fine central carina, scarcely traceable on the fourth and fifth segments; all have a posterior submarginal row of very minute granules; the last three narrow segments are smooth. The first segment on the lower side is very large, smooth, centrally grooved, with the posterior edge somewhat produced and broadly truncate. All the other segments are finely rugose; the second and third being very narrow.

All the joints of the cheliceres are internally distinctly pilose. The first joint is sparingly punctated; on the median anterior part it is transversely rugose, terminating with a sigmoid, pointed process. The second joint has an anterior rounded shovel-like edge provided with six subequal denticles, of which the two outermost are more distant from the other four than these among themselves; on the lower edge there are two unequal denticles. The third joint is short, with a small denticle at the inner upper end and a larger one on the middle of the lower inner edge. Both the second and third joints are densely punctated above and outwardly, and granular below; the following are mostly smooth. The fourth joint is slightly thicker than the third, with a long, pointed, anteriorly and posteriorly serrated process; it has no spine on the lower side. The fifth joint is again somewhat more inflated with a short, broad, depressed process, sharply serrated on both sides; on the front margin of the lower side there is a minute denticle. The sixth joint is slender, considerably longer than the process opposite to it; the upper and lower inner edges are, as usually, finely serrated. and near the tip there is on the upper edge a conspicuously enlarged tubercle.

The tarsi on one of the first pair of feet are shorter than the preceding metatarsus. The femoral joints of the other feet are compressed, granular

above, smooth below; the last foot is very little shorter than the whole body, and the caudal seta fully equals in length the latter, it is multi-articulate and densely pilose.

Upper side of cephalothorax and abdomen dull brownish black; cheliceres shining deep chesnut, feet and seta bright chesnut. Lower side,—cheliceres same as above, feet, sternum and first abdominal shield bright chesnut, rest of abdomen deeper chesnut.

Total length of cephalothorax and abdomen,			m.	
Length of the five last joints of cheliceres,			,,	
, ,, cephalothorax,	12.1	,,	,,	
, ,, abdomen,	22.	,,	,,	
,, first pair of feet (with coxæ),	38	,,	,,	
, ,, second,	22.	,,	"	
, ,, third,	24.	,,	,,	
, " fourth,	83.	,,	"	
, ,, caudal seta,	36.	,,	,,	

The preceding description and the figures refer to a South Indian specimen which I had received from Major Beddome.

Another specimen was collected by Mr. Ball near Sirgúja in Western Bengal. It agrees with the former in every particular, except that the denticles on the second joint of cheliceres are somewhat stronger, and that the fourth and fifth joints are not so much inflated, both being only slightly thicker than the third.

Several other specimens were obtained by Mr. Wood-Mason's collector at Jahore, at the extreme south end of the Malay Peninsula. These also agree in every point of structure, the proportions of the body, &c., with the type form, but the first, second, third and fourth joints of the cheliceres are more densely punctated, while the tumidity of the fifth is intermediate between the South Indian and the Bengal specimen. The six denticles on the second joint of the cheliceres are well developed, and the process on the fourth is a shade broader than in either of the two Indian specimens.

Judging from the references to the two localities Madras and Bengal, it would seem probable that the present species had been alluded to by Mr. Butler under the name *Th. caudatus*, though the remark referring to the broad body and depressed abdomen would rather apply to the next species.

But here the question arises what is *Thelyphonus caudatus* = *Phalangium caudatum* of Linnseus? Mr. Butler (loc. cit.) gives among others as the reference of *T. caudatus* Linné's Syst., and Fabricius' Ent. Syst. If anybody will look through these references, he will, I think, find very little satisfaction in the definition of *T. caudatus*.

As habitat of the species, Mr. Butler gives Ceylon, Madras, Bengal and Tenasserim, and says that it is a broad, well marked form, having

six teeth on the second joint of cheliceres and a very depressed* abdomen, and that it has been confounded with two, if not three, other species! Now I confess after having carefully looked over the references alluded to and Mr. Butler's notice, I have not succeeded in tracing Linné's T. caudatus, nor will, I think, anybody else do so; and if the species has been confounded by older writers, as no doubt it was, Mr. Butler has only added his share to that confusion.

Let us see whether and how far we might be justified to adopt the name T. caudatus.

Linné named a species in 'Syst. naturæ 619, n. 2' Phalangium caudatum, which he characterises as 'chelis ramosis, ano setifero.' In Museum Lud. Reg., 1764, p. 426, the celebrated author describes the same species in detail and gives 'habitat in Java,' quoting at the same time Seba's figures 7 and 8 on pl. 70 of his Thesaurus. To determine anything according to Seba's figures is an altogether hopeless case, but we know that Linné's description of Ph. caudatum was drawn up after a Javanese specimen, and we must, therefore, look to Java for Linné's Ph. caudatum. When we see through our literature we find, I think, only two descriptions and figures, which can bear out any comparison with Linné's type, and these are Lucas' Th. caudatus ex Java, and Koch's Th. proscorpio ex India orientali et Java.

In reading carefully over Linné's description, I think, the passages forpusferrugineum,........chelæarticulis 5 constructæ β (i. e. articulus tertius) subrotundus, inermis,... γ (i. e. art. quartus) subrotundus...... are decidedly more in favour of Lucas's than of Koch's figure. If we, therefore, wish to retain Linné's name we can reasonably, I believe, only adopt it in the form in which it had been introduced into science by Lucas in his Monograph of the genus in Guerin's Mag. de Zoologie for 1835. Any other meaning, which we force upon Linné's name, is more arbitrary than this, still I do not wish to leave altogether the references of previous authors to this name without notice.

I have already (p. 133) stated the reasons, which appear to me to indicate that Koch's reinstated *Th. proscorpio* of Lattreile is distinct from Lucas' *Th. caudatus* of Linné.

Fabricius copied Linné. In Syst. entomologiæ, 1775, p. 441, he only added 'habitat in India orientali,' and I do not think it improbable, that several specimens of *Thelyphoni* had been sent by the French and German Missionaries from South India to European Museums.

Pallas' two figures most probably refer to Th. scabrinus. He also had Indian specimens.

Lattreille, both in his Hist. nat. des Crust., p. 130, pl. lx, fig. 4, and in his Gen. Crust., p. 130, evidently confounded various species from differ-

Linné says : abdomen ovato-oblongum, supra et subtus gibbum.

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ent parts of the world under one name. He does not give any descriptions.

The figure in Guerin's Régne animale would, if correct, represent a species distinct from Th. Antillanus, Koch, as already (p. 128) observed.

Douges and M. Edwards' figure in their edition of the Régne animale most likely represents Koch's T. proscorpio.

I do not think it would be profitable to go further with this review, even if I had all the old books at hand. I have looked over many of these historical figures and descriptions, and if anybody wishes to study the history of the genus, he might do the same, but if he wishes to determine his species, he will find it much more profitable, to ignore every reference written prior to 1835, the date of Lucas' Monograph of the genus.

THELYPHONUS BEDDOMEI, n. sp. Pl. XII. Fig. 6.

Upper side of body granular, of cheliceres sparely punctated; length of the five terminal joints of cheliceres equal to the first eight abdominal segments, these have on the upper side a median thin ridge; second joint of cheliceres with seven denticles on the upper edge; third joint on upper side shorter than the fourth, above and below with a spine; the length of one of the last limbs very nearly equals the total length of the body; a very fine short ridge in front of the lateral eyes; first lower abdominal segment enlarged, along the middle indistinctly grooved, with the posterior edge centrally much produced and rounded.

Hab .- Annamally mountains, South India.

The cephalothorax is much higher anteriorly than posteriorly, rounded in front, with the ocular tubercle prominent, smooth, its posterior portion being separated by a fine incomplete transverse groove from the intra-ocular one; central eyes of moderate size, dull yellowish; lateral eyes amber coloured, with a short, very thin and finely serrated ridge in front of them, disappearing already at the middle of the distance between the lateral and central eyes. Cephalic thorax granularly rugose, shining; thoracic portion conspicuously broader, more finely granular, dull. Cephalic groove deep, median thoracic and postocular pits and lateral groove well developed, smoothish, shining. Sternum clongately semi-elliptical. Abdomen rather broadly ovate and depressed, above granular, with very slightly raised posterior and lateral margins, the first eight segments with a central longitudinal fine ridge. Sides granularly scaly. Lower surface almost smooth, with spare fine pits; first segment much larger than any of the others, depressedly convex, longitudinally indistinctly grooved, and with the central posterior edge considerably and rather narrowly and roundly produced.

First joint of cheliceres with the usual anterior process, provided with a rapidly attenuated sharp point. Second joint on the upper edge with seven denticles, of which the outermost is the smallest and the median on

the inner anterior corner the largest; below with two subequal denticles. Third joint with a distinct denticle on the upper and a slightly larger one on the lower side, the latter is accompanied by a minute sharp granule. These two joints are above and below rather densely punctated. The fourth joint is more swollen and larger than the third, with a depressed, anteriorly and posteriorly sharply serrated process, and a little spine on the median anterior lower edge. Fifth joint somewhat thinner than the previous, with a quite similar process than on the preceding joint, but slightly shorter, and also with a denticle on the lower side. Sixth joint, or movable claw, long, with the upper and lower inner edges serrated.

Tarsi of first pair of feet slighly shorter than the preceding metatarsus. All other feet with compressed, and on the upper side finely granular, femoral joints. Caudal seta slender, with rather elongated, hairy joints; its length equals that of the whole body.

Body including the seta, above, dark brown, on the cheliceres and on the cephalic portion of the thorax shining blackish brown; feet chesnut; lower side, deepest brown on the cheliceres and on the posterior end of the abdomen, dark brown on the first joint of cheliceres and on the anterior part of the abdomen, and lighter brown on the come of the feet and on the sternum.

Total length,				m.	m.	
Length of the five terminal joints of cheliceres,			19	,,	,,	
•	97	" cephalothorax,	11.5	,,	"	
		" ubdomen,				
		" first pair of feet,				
		" second, "				
	,,	, third, ,	25.5	,,	33	
		" fourth, "				
		" caudal seta,				

The number and distribution of the denticles on the second joint of the cheliceres, the broad abdomen, the form of the first lower abdominal segment, and the slightly longer limbs distinguish the present species from the previous.

Explanation of plate XII.

- Fig. 1. Thelyph. scabrinus, n. sp., p. 130; 1a, right chelicer, enlarged. twice the nat. size; 1b, four anterior lower abdominal segments.
- Fig. 2. Thelyph. Assamensis, Stol., p. 133, right chelicer, enlarged twice the nat. size; 2a, four anterior lower abdominal segments.
- Fig. 3. Thelyph. (conf.) angustus, Lucas, p. 134; 3a, loft chelicer enlarged three times the nat. size; 3b, four anterior lower abdominal segments, enlarged twice the nat. size.
- Fig. 4. Thelyph. formosus, Butler, p. 137; 4a, right chelicer, and 4b, first four lower abdominal segments, both enlarged twice the nat. size.
- Fig. 5. Thelyph. indicus, n. sp., p. 138; 5a, right cholicer, in twice the nat. size; 5b, four first lower abdominal segments.
- Fig. 6. Thelyph. Beddomei, n. sp., p. 142; 6a, left chelicer, in twice the natural size; 6b, four first lower abdominal segments.

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NOTE ON THE GENUS GYMNOPS, W. BLANF., (LACERTIDE),—by W. T. BLANFORD, F. G. S., C. M. Z. S.

[Received 12th April, 1873.]

In the Journal of the Asiatic Society of Bengal for 1870, Vol. xxxix, Pt. II, p. 357, I proposed to distinguish a new and peculiar form of Ophiops from Chhatisgarh by the subgeneric title of Gymnops. The species, to which I applied the name of Ophiops (Gymnops) microlepis, differs from the typical forms of Ophiops found in India and Western Asia in its more elongate proportions, longer tail, single postnasal and minute dorsal scales.

Dr. Stoliczka has since obtained the same species in other parts of India and especially in Kachh (J. A. S. B. 1872, Vol. xli, Pt. II, p. 90 and Proc. A. S. B. 1872, p. 74), and he has adopted the name Gymnops as a generic term, founding the distinction from Ophiops mainly on the difference in the character of the dorsal scales, which are much smaller and more granular than in true Ophiops, although they are distinctly keeled and imbricate. Quite recently Proc. A. S. B., July 1872, p. 126, Dr. Stoliczka has described a second species Gymnops meizolepis from Kalabagh on the Indus. This has somewhat larger scales than G. microlepis, but it possesses the same elongate form, the tail from the anus being more than twice the length of the body, and it again presents the peculiarity of a single postnasal instead of two or three as in Ophiops.

But the name *Gymnops*, whether considered as 'generic or subgeneric, cannot be retained for this type of naked-eyed lizards, as it has been twice employed in ornithology, having first been applied by Spix to a South American genus of Raptores, for which, however, an earlier generic title viz., *Daptrius* existed, secondly by Cuvier to a Malayan genus of *Sturnidæ*, allied to *Eulabes*.

Under these circumstances I propose to change the name of the Indian lacertian genus, above specified, to *Chondrophiops* in reference to its somewhat granular scales.

ON AQUILA BIFASCIATA AND AQUILA ORIENTALIS,—by W. E. BROOKS, C. E., ASSENSOLE.

[Received 8th April, 1873.]

I have long had in my possession two specimens of Aquila orientalis, Cab., one sent me by Dr. Bree and labelled by Mr. Gurney, and the other from Mr. Dresser. The latter is a Sarepta specimen from the Volga region, and the former, from the Dobrudscha.

On returning the Dobrudscha example, which Dr. Bree had submitted to Mr. Gurney, the latter sent the following memorandum.

"The eagle which I have ticketed 'Aquila orientalis, Cab.,' is identical with that so often sent in collections from Sarepta near the mouth of the Volga, and is in fact the only species of Eagle which I have seen from that locality. I have hitherto been in the habit of calling this eagle 'Aquila clanga of Pallas,' but as Pallas does not appear, by the description of his Aquila clanga in the Zoog. Ross. As., Vol. I, p. 351, to distinguish between this eagle and the smaller spotted eagle A. nævia, and as his measurements. which are given in old French feet, inches, and lines, (for a scale of which see Finsch and Hartlaub's Vogel Ostafr.) agree better with A. nævia than with the present species, it will perhaps be best to adopt for the present species the name of Aq. orientalis, proposed by Cabanis in the Journal für Orn. 1854, p. 369, (note), which though not very well chosen is the next in order of priority and the earliest that can with certainty be applied to this eagle exclusively. The specimen now sent appears by its measurements to be a female, and is in adult plumage; the immature birds of this species being spotted in precisely the same manner as those of Aquila nævia which is well shewn in Yarrell's figure of the 'Spotted Eagle.'"

I quote this memorandum by Mr. Gurney to shew upon what good authority one of my specimens is named Aquila orientalis, and the other, sent me by Mr. Dresser labelled A. clanga, Sarepta, closely resembles it.

Mr. Gurney's statement, that the immature is spotted like Aquila novia, is, as far as I can see at present, a mistake; for we have the bird in India (A. bifasciata) and it never in any way resembles A. novia.

I have, from the first, been struck by the great similarity of these two specimens to our Indian Aquila bifasciata, Gray and Hardwick; but had not till the other day obtained Indian specimens according in every respect, to a feather, with the European examples of A. orientalis, above referred to. Now I have, and the accordance is so beautifully perfect, that there is no

alternative, but to come to the conclusion that A. orientalis is identical in every respect with A. bifasciata.*

I have now, therefore, three European killed examples of A. bifasciata; the third being that sent me by Capt. Elwes, and referred to in "Stray Feathers," Vol. I, p. 291. The two first are in nearly mature plumage, and the third is quite mature; and is the finest specimen of the bird I have seen.

The two sent as "A. orientalis" have only slight indications of the nuchal patch; otherwise I should have recognized them at the first glance as A. bifasciata, as was the case with Capt. Elwes's Bosphorus bird. This term has, I believe, priority over A. orientalis, Cabanis, and if so will be retained for this engle.

The application of Pallas's term "A. clanga" to the same species by some European writers is, I believe, an error, if I read the original description correctly. It appears to refer to our Indian spotted eagle which we accept as Aq. nævia, and which I believe to be the true nævia. Klein, whose work is dated 1750, is the author of the term Aquila clanga, and Pallas quotes and adopts this synonym in preference to the older term Aquila nævia, Schwenckfield. This term Pallas also quotes under the head of Aquila clanga, but as a synonym. Schwenckfield's work is dated 1603.

In a letter received the other day from my friend Mr. Anderson, he records the occurrence of a lineated A. Mogilnik at Aden, which was stunned by flying against the telegraph wires there.

I may as well mention here that the Indian Imperial Eagle, to which I applied Hodgson's term of A. crassipes, is identical with the East European bird, A. Mogilnik, better known as A. imperialis, but the former is the prior term.

I compared our bird with an adult Turkish specimen sent me by Dr. Bree. Mr. Gurney also came to the same conclusion, after comparing the adult Indian birds, I had sent home, with European examples.

The West European Imperial Eagle is, however, quite distinct and is now known as A. Adalberti, Brehm. This is the species said to have no lineated stage, and having, when adult, an excess of white on the scapulars and ridge of wing.

* [Mr. V. Ball and I had the pleasure of comparing the two specimens of A. orientalis, referred to by Mr. Brook, with a series of Indian A. bifasciata. They undoubtedly appear to be perfectly identical, both in structure and coloration. If the determination of those two specimens as A orientalis is correct, (and upon such good authority, as Mr. Gurney, it ought to be), there can be no doubt that the two species must be considered as identical. F. Stolicska.]

I sent a fine series of our Indian Aquila hastata to the Norwich Museum. Mr. Anderson also sent one example in mature plumage.

Besides these we sent others to ornithological friends. I hear from Messrs. Gurney and Dresser, that the adult plumage of this species is not to be distinguished from that of the small Pomeranian spotted Eagle which they term the true Aquila navia.

They assert, however, that though the adults are alike, the immature birds differ.

This is a point for further investigation, but the perfect accordance of the adults leads me to expect the same in the immature birds. The connection between the immature and the adult is the first point to be established, and this can only be done by the field naturalist.

One of my ornithological friends informs me that the immature of A. orientalis (which we have shewn is A. bifusciata), has spotted plumage like that of A. nævia; another friend informs me he has received the immature bird, and it "is strangely like A. bifasciata!" Now the latter eagle is not spotted, and the "doctors," who are both men of repute, "differ."

These points will all be cleared up it is to be hoped before long; and we shall perhaps have the natural history of the Eagles as clear and as correct as that of the common Rook, with little or nothing else to be learned. At present the Eagles appear to be in a state of dire confusion, which the English naturalists are daily making worse.*

* Since the foregoing was written, Capt G F. L. Marshall, who is much interested in this subject, came and examined the series used. He fully concurred in the identification of A. orientalis with A. bifusciata, and was even more positive than I was that the Danzie killed Aquila hastata was indeed that species. It will be remembered, it was sent to me labelled "A. næria." My English Ornithological friends with whom I communicated are incredulous regarding my identifications, and I, therefore, refer to my friend's corroboration. If all fulls to convince them I shall have the series exhibited at a meeting of the Zool. Society.

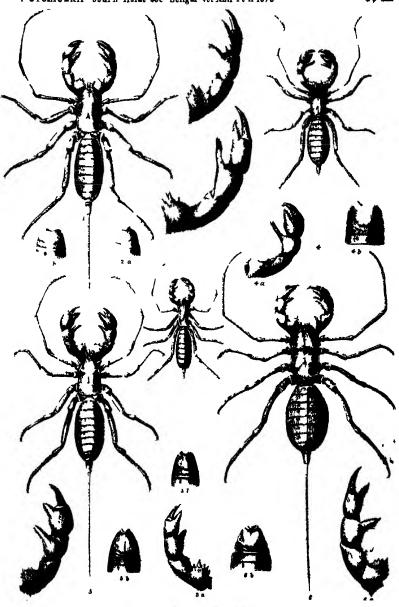


Hepolure Benthamiena , Schott





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A CONTRIBUTION TOWARDS A MONOGRAPH OF THE INDIAN PASSALIDE,—
by Dr. F Stoliczka.

[Received 27th April, read 7th May, 1873]

• Some years ago, when I visited my veteran friend Dr. J. J. Kaup in Darmstadt, I found him, quite unexpectedly, busily engaged with Passalible He urged me most strongly to collect Indian specimens, which I did; but the collection progressed so very slowly,—in spite of the very numerous applications which I made for as-istance,—that Kaup's Monograph of the family appeared early in 1871* without my little contribution in the way of Indian materials.

When I saw that the geographical distribution of the Passalina is so very peculiar and interesting for the study of our Indian fauna, I resolved to continue my researches, and to publish as far as possible a revised Monograph of all the Indian species, with such little additions to the anatomy and development, as might be obtainable. Of these points I shall, however, not speak on this occasion, they will be fully treated in my Monograph, which will be accompanied with all the necessary illustrations. I will merely mention that in India we meet with Passalina in those districts only which have a Malayan fauna. No species is as yet known from the Himalayas west of Nipal, or from any part of Central India or the Panjáb.

The object of the few following lines is chiefly to give a list of the Indian species with authenticated localities, together with diagnoses of the new species which had lately come under my observation. I am sorry that I cannot complete more fully the task which I undertook, but in the middle of pre-

Berliner Entomologische Zeitschrift, vol. zv.

parations for an expedition to Central Asia I am not allowed to do more, than to shew those who assisted me that their materials had been duly appreciated. My old friend Dr. C. Felder, the Lord-Mayor of Vienna, has sent me the whole of his collection of Passalidæ for examination, and Dr. L. Redtenbacher, the Director of the Vienna Museum, sent me a great number of eastern species. These are rare instances of liberality and true interest in the work. My thanks are further due to Messrs. W. S. Atkinson and J. Wood-Mason, Messrs. Peal (Assam) and Mandelli (Darjeeling), Major H. H. Godwin-Austen, Major Beddome, Mr. Stahlknecht of Singapore, Mr. Theobald, Rev. Baker, Dr. Cameron, the late Dr. Walter Abbey and the late Capt. Mitchell of Madras. The original collection in our Museum contained only five of the commonest species.

In recording the species I will follow Kaup's last Monograph on the subject. Whatever opinion various naturalists may have regarding the mode of classification which that distinguished author has adopted, I do not think that they will find much fault with the limitation and characteristics of the genera* and species. Undoubtedly that Monograph is the most complete and the most remarkable paper which the philosophical school of naturalists has in late years produced. I am now not prepared to say anything for or against it, but I will do so in my Monograph, when I hope to have examined a larger number of PASSALIDE, than I had been able to do up to the present. Such mental productions; must not be disposed of with prejudice, they are entitled to receive a fair trial and a full share of all opinions pro and con, before we side one way or the other. Nobody will, after careful perusal, deny the fact, that Kaup's classificatory arrangement has in many respects very considerable advantages; it is easy and practical, but time and research must show whether it can be adopted or not. Whenever I shall have any scruples against generic definitions, or against the quinquennial divisions, I shall state my reasons without any reference to the validity of the whole system.

Before proceeding to the details I have only to mention that I shall include in the present list all the species known to occur in the East Indies, viz., India proper (Vorder-Indien), with Eastern Bengal, Burma, and the Malayan Peninsula as far south as Singapore (Hinter-Indien).

Sub-fam. AULACOCYCLINÆ.

1. Aulacocyclus Parryi, Kaup.

I received numerous specimens from Malacca.

- * Even in the very limited sense in which the author defines them.
- † For a short exposition of the principles of the system, and a brief discussion thereon, see Proc. of the Society for May, 1873.

2. CERACUPES AUSTENI, n. sp.

This species possesses all the characteristics of the genus, as given by Kaup. Total length 22 m.m., width of head 4.8, of prothorax 6.6, of wings at the shoulders 6.8, length of elytra 12.3 m.m.

In general structure it is very like *C. fronticornis*, but the clypeus-horn is obtusely rounded at the end, not emarginated, the upper concave edge is punctated, longer and narrower than in that species. The processes on the jaws are posteriorly flattened and rugosely striated, anteriorly convex and smooth. The lateral scar of the prothorax forms a punctated S. Scutellum smooth, waist at the sides densely punctated.

The furrows of the wings are coarsely punctated, without any perceptible hair. The metasternum is convex, generally smooth, only along lateral margins finely punctated. The median tibiæ have externally two spines, the posterior ones only an indication of a small point.

Hab.—Naga hills, North Eastern districts of Bengal. Major H. H. Godwin-Austen found a couple of specimens at an elevation of 6000 feet.

I have never received C. fronticornis from any of these districts. It must come from the Chinese portion of eastern Tibet, for western Tibet has no forests.

3. Conacupes cylindricers, Perty.

• Hab. Johore, at the southern end of the Malay Peninsula. One specimen measures: total length 26.4 m.m., width of clypeus 5.5, (Kaup gives 7 m.m.) width of prothorax 8, (Kaup gives 9), length of clytra 14.9 m.m., (Kaup gives 25½, which is clearly a mistake for 15.5 m.m.).

Kaup's specimens from Malacca appear to have had a much broader clypeus and prothorax, but the two Johore specimens which I examined agree with the description of the species in every other detail.

4. Comacupes Masoni, n. sp.

Total length 30.5 m.m., width of clypeus 6.4, of prothorax, or shoulders, 9.1, length of clytra 16.75 m.m.

Resembles C. basalis, but is much more slender; upper lip with the front surface sloping, but scarcely indented at the edge; densely hairy. Clypeus densely punctated and shortly hairy, except in front of the horn, which is large, compressed, strongly projecting in front and very slightly elevated, with an obtuse end sharpened from below, its posterior end is almost vertical without a free point, the upper ridge is obtusely rounded, except for a short distance along the middle which is concave and rugose. Prothorax with the lateral scar small, smooth, with a little dot in front of it, as in C. cylindraceus, but in the present species the marginal furrow is in front near the corner almost angularly bent in. The furrows on the wings are slightly more coarsely punctated, than in the last species.

Scutellum and the waist at the sides and the whole of the lower side densely punctated and shortly hairy. Lower lip densely and coarsely punctated and hairy, with barely an indication of a central carina. The last four abdominal segments almost quite smooth. Middle and hind tibiæ each with a strong spine.

Hab.—Johore, obtained by Mr. J. Wood-Mason.

Kaup quotes *C. cavicornis* from Malacca and Penang. I have not seen it, but there is a specimen of a *Comacupes* in Dr. Felder's collection, evidently belonging to a new species.* Its locality is given as Bras., which clearly means Brasilia, there is, however, no such form described from America, the specimen came much more likely somewhere from the Philippines.

- 5. Tæniocerus pygmæus, Kp.
- Malacca. I have as yet obtained only a single specimen.
- 6. TENIOCERUS BICANTHATIS, Guér. Johore, north of Singapore.
- 7. Tentocerus bicuspis, Kp. Sikkim, Assam and Cachar hills. Common. Kaup also gives Malarca.

Sub-fam. ERIOCNEMINÆ. First group. Solenocycler.

8. PLEURARIUS BRACHYPHYLLUS, n. sp.

Total length 43, width of clypeus 9.8, of prothorax 12.5, length of clytra 14.2; total length varying from 41 to 44 m.m.

* Comacupes Felderi, n. sp. Total length 22.5, width of clypeus 5, width of prothorax 6.6, of shoulders 6.8, length of clytra 13.2 m.m. Upper lip in front and laterally deeply concave, as in Aulac. teres. Jaws with the upper of the three front teeth very small. Clypeus smooth, with a fine groove along the anterior straight margin. Horn situated far behind, as in basalis, rising almost vertically, slightly inclined forward, behind with a convex, smooth, simple and rounded edge; anteriorly below the point it is first vertically truncated, then concave, falling with a broad surface to the large forchead. Ocular ridge sharply angular in the middle, terminating with a small sharp point in the anterior corner of the clypeus.

Prothorax with a median groove, deepest about the centre, and a punctated, complete marginal furrow, only slightly bent in anteriorly; lateral scars small, subsemilunar, deep, finely punctated. Wings in the furrows indistinctly punctated, not hairy. Scutellum smooth, waist at the sides finely punctated, below entirely smooth as is also the case with the metasternum and the abdominal segments. Tongue with a central carina and with the lower halves of the sides somewhat concease and roundly dilated. Lower lip smoothish in the middle, with a central impressed projection in the front edge; its lateral branches densely punctated. Tibise of the front feet very broad, each with aix denticles; middle and hinder tibise stout, each with a sharp spine.

Jaws bidentate at the end; upper lip truncated in front, covered with red stiff hairs. Antenme long, with only three short terminal lobes. Clypeus uneven, but not punctated; the central horn is flatly convex, smooth, transversely very elongately subtriangular, anteriorly with a small projection, ending in a small free point, from which diverge in a slight curve the frontal ridges, terminating with distinct tubercles near the front edge. This frontal edge has a sharp process above each of the two lateral margins of the upper lip, the left appears to be occasionally a little larger than the right one, recalling a similar structure in Basilianus. The two frontal tubercles are connected by a low ridge and the margin between them is deeply concave. Supraocular ridges with a sharp point above each eye, flattened in front, and externally at each corner terminating with a small spine.

Prothorax moderately convex, with a distinct central groove, but not extending anteriorly to the margin; marginal furrow narrow, finely punctated; lateral scar forming a shortly elongated and smooth impression.

Scutellum at base finely punctated and hairy, along each side of the centre finely strigated. Waist laterally densely punctated, below smooth, somewhat transversely rugose, but without any special scar.

Elytra with the shoulders somewhat swollen and projecting, smooth; all the furrows distinctly punctated.

Tongue long, with a median and two marginal ridges, strongly contracted in the lower half. Lower lip with its branches entirely punctated and hairy, slightly depressed in the middle.

Metasternum laterally densely punctated, but the posterior sloping corners are smooth, which is also the case with all the abdominal segments.

Prothorax at the lateral lower sides, and the median femora, covered with dense, long, rufous-brown hair; anterior femora, sides of metasternum and hinder tibic a little less hairy.

Hab —Nilgheries and Malabar. I received originally two specimens of this species from the Madras Museum, but since then several others have been sent to me by Major Beddome and Rev. Baker.

Kaup describes a single species, *P. pilipes*, from Sumatra. The generic characteristics have to be slightly altered, but in all essential points the South Indian species agrees with *Pleurarius*.

9. SEMICYCLUS REDTENBACHERI, n. sp.

Total length 25.4, width of clypeus 5.2, of prothorax 7.3, of shoulders 7.1, length of clytra 14.3 m.m.

Jaws rather short, each with three denticles; antennæ moderately elongated, the three terminal lappets well developed and equal; upper lip squarish hairy, very slightly concave at the front edge.

Clypeus rugose, punctated on the forehead, front edge very slightly emarginate in the centre, and with a small projection above the edges of the

upper lip. The horn originates in a slightly convex smooth tubercle, and extends freely and almost horizontally to near the front edge, its base is posteriorly and at the sides surrounded by a slight furrow, and from the point where the horn becomes free originates on either side a low, indistinct ridge, which makes a curve anteriorly and terminates in a small tubercle some distance short of the marginal projections. Supraocular ridges undulating, each with a sharp point above the eye and another at the anterior corner of the elypeus.

Prothorax convex, with a central groove; marginal furrow incomplete, punctated, terminating anteriorly, some distance from the central line, with an elongately ovate scar. Lateral scar large, slightly impressed, composed of a number of irregularly arranged, coarse pits; a few dots exist near the anterior corner.

Scutellum very finely punctated at the base; waist laterally densely punctated, below nearly smooth.

Elytra rather depressed above, but comparatively high; all the furrows coarsely pitted; each shoulder with a tuft of brown hair, which also extends a little posteriorly along the margin.

Tongue with three ridges, minutely punctated, tridentate at the front edge which is slightly narrower than the base. Lower lip transversely rather elongated, smooth, convex, with a rounded scar at each end; the lateral branches densely punctated. Metasternum on the posterior sloping corners' coarsely punctated. Abdominal segments with an oblique furrow on either side, but in other respects nearly smooth.

Hab.—Ceylon. The only specimen examined is in the Vienna Museum; it was obtained by the late Mr. Zelebor during the Novara expedition.

The species almost perfectly agrees with the characteristic of the genus as given by Kaup.

Second group. LEPTAULACEÆ.

Out of the five genera distinguished by Kaup only one is represented in India, namely Leptaulax. It seems to be a little too closely allied to Ciceronius, and still more so to Didimus. From the last it is stated to differ by the single denticle in the centre of the front edge of the clypeus, while Didimus has two; but I have in a few instances also observed two denticles in both Lept. bicolor and dentatus. Of course we may say, what is in Didimus the rule, is an exception in Leptaulax, still it looks rather a little arbitrary to define genera in such cases. However, as I have not a single one of the species of Didimus, described by Kaup, for comparison, I do not wish to propose any changes in the genera, as characterized by him. Looking at Leptaulax in Kaup's sense, it seems to me somewhat doubtful that the number five will suffice to include all the different forms which must belong to the genus. The following details, taken with those of Kaup, may speak for themselves.

10. LEPTAULAX DENTATUS, Fabr.

The typical small form was obtained from Sikkim, Bútán, Assám, Tenasserim (at Mergui) and from Johore. In the Vienna collections it is represented from nearly all the Philippine islands.

The larger form, or *L. Timorensis*, is also very abundant in Sikkim (between 500 and 1000 feet), Bútán, Assám, Naga hills, Pegu (near Tonghú), and on the Andaman islands. It grows up to 37 m.m. I had very large numbers of both forms for comparison, and came to the conclusion that no definite characters exist by which the two species could be separated. I have all intermediate sizes from 21 to 37 m.m.

11. LEPTAULAX BICOLOR, Fabr.

Very common in Sikkim and through the whole of the Malayan Peninsula, as well as on the Andaman and Nicobar islands, in Malabar and in Ceylon. Form the last locality two specimens exist in the Vienna Museum collection under the name of *Nietneri*, M. C.

A peculiar small variety, possessing cross bars in the lateral furrows of the elytra, instead of simple dots, occurs at Johore.

12. LEPTAULAN PLANUS, Illig.

This is, I think, a good species, the smallest of all our eastern Passali. D.E. It is very much more depressed, than either of the previous species, and in proportions and relative size of the prothorax and of the elytra it more closely resembles deutatus than bicolor, of which it is stated to be a synonym. Specimens from Java, Johore, and Malacca, whence I have lately obtained large numbers, measure between 13 and 14 m.m., but a somewhat larger variety occurs in Burma and on the Andaman islands. Specimens from these last localities measure 18 m.m., they are in almost every other respect identical with typical planus.*

Of the third group, the ERIOCNEMINE, no species as yet occurred within our limits. I received *Vellejus Moluccanus* from Amboina, *Eriocnemis monticulosus* from Sumatra, and gigantic specimens of *Erioc. tridens* from Java, but none from Siam or Malacca, which localities are also given by Kaup. The last species will have, therefore, to be included in our list.

Fourth group. MACROLINE.

13. MACROLINUS LATIPENNIS, Perch.

Malacca; apparently rare.

14. MACROLINUS WEBERI, Kp.

Johore; a single specimen from Mr. J. Wood Mason.

In Dr. Felder's collection I find a Malacca specimen named pasitus?

Dr. Redtenbacher (Coleopteren, Reise Oest. Fregatte Novara, 1867, p. 49) gives Mastachilus politus* from Madras. There is a specimen of that species in the Vienna Museum collection, marked Ind. or., and is most likely the one referred to by Redtenbacher. I very much doubt, however, that it is Indian. It was probably received from the Madras Museum, or from a collector, during the stay of the Novara at Madras. My reason for doubting the correctness of the Indian locality is based upon an observation which I made. I asked the Curator, the late Capt. Mitchell, for the loan of any specimens of Passali, he might have in the Madras Museum. I was promptly responded to, and shortly after received four specimens of Passali. Two proved to belong to a new species Pleurarius brachyphyllus, and the two others were Solenocyclus exaratus (known from Madagascar) and Mastachilus polyphyllus (from Australia). † After detailed inquiry Capt. Mitchell informed me, that the two first specimens (distinguished by numbers attached to them) were truly Indian, from the Nilgherries, but that the localities of the two others were unknown. They had been received from some old European collection. It seems to me very probable that something similar happened with the specimen of M. politus, obtained by the Novara at Madras.

Kaup describes *Macrolinus Waterhousei* and *Episphenus Moorei* from Ceylon. I have not seen either of thesc.

Fifth group. ACERAIE.

Of the five genera, Laches, Gonates, Aceraius, Cetejus, and Basilianus, only the third and fifth have as yet been found in India; they are common and numerous, and the specific number of five will, I am sure, run short for what is in this case really required for specific determination, unless the genera are somewhat differently defined and grouped.

Of the other genera I have examined a few interesting species. Among these is one which Kaup would probably call the first, moderately convex, species of Laches, and the largest species of Cetejus; both answer exactly the characters of the respective genera. I add descriptions of the two new species; in a foot note.

- Originally described by Burmeister from Van Diemen's Land.
- † The Vienna Museum possesses two specimens of polyphyllus from China.
- ‡ Laches gracilis, n. sp. Total length 26, width of head 5.5, of prothorax 7.5, of shoulders 7.6, length of elytra 15 m.m. Whole body moderately convex.

Upper lip almost quite straight in front; left jaw barely longer than the right one. The three first lobes of the antennæ short, the fourth slightly shorter than the fifth. Clypeus on its posterior half rugosely punctated; the short horn rises from the anterior central edge of a transversely elongated, smooth protuberance; from it proceed under a narrow angle the frontal carinæ, each terminating in an elongated smooth tubercle, or rather short ridge, connected by a very fine carina. The marginal tubercles of the clypeus are pointed, depressed, placed nearer to each other than the width of the

A specimen of Gonates naviculator from the Moluccas, in Dr. Felder's collection, has the middle frontal carina very distinct, while two others of

upper lip, they are unequal, the left being slightly larger than the right one; they are not in any way connected with the frontal tubercles, but a smooth concave field proceeds from each of these to the respective ocular ridge. The latter is angular or subtubercular above each eye, and anteriorly formed by a thin carina, terminating on the angle of the clypeus with a little spine.

Prothorax somewhat broader posteriorly than anteriorly, with a very distinct central groove; marginal furrow very narrow, with a minute punctation; lateral sears vertical, subovate, punctated; a group of distinct dots also exists above each anterior corner.

Scutellum smooth; waist laterally punctated. All the furrows of the elytra coarsely punctated, without a trace of any kind of hair.

Tongue tricarinate, the middle carina the strongest; laterally slightly concave. Lower lip convex, smooth, with a transversely elongated, small, marginal, smooth scutellum between it and the tongue; branches coarsely punctated. Waist, below, with a small oblique, evate scar on either side. Metasternum on the posterior part sparsely, on the sloping corners densely punctated. Abdominal rings each with a linear, punctated scar on either side. Prothorax, below, as well as the middle and hind tibes, sparsely covered with yellowish rufescent hair.

Hab .- Batchian island; a single specimen in the Vionna Museum.

CETEJUS AUSTRALIENSIS, n. sp.

Total length 33, width of head 7, of prothorax 99, of shoulders 96, length of colytra 192 mm. Whole body rather depressed

Loft jaw slightly longer than the right one. Upper lip deeply omarginate, the right half being slightly shorter and a little more rounded than the left one, as in G. nanculator. Antennæ with six lappets, the two first being very short, the third a little shorter than the three terminal ones, which are subequal and rather slender. Clypeus entirely rugose; the horn is elongated, with a triangular tubercle on each of its basal halves. The frontal ridges issue from the horn under a moderately obtuse angle, (as in Lept. dentatus), and terminate with distinct points, connected by a very fine carina, from which the margin of the clypeus descends almost vertically. Both marginal tubercles are pointed, similarly formed, but the left one is conspicuously larger than the right. Each frontal tubercle is connected by a short carina with its corresponding marginal one, and besides also with its corresponding small tubercle in the middle of the supra-coular ridge, each of which is truncated in front.

Prothorax slightly broader posteriorly than anteriorly, with a fine but almost complete central groove; sides entirely punctated, lateral scar small and rounded; marginal furrow very narrow.

Scutellum smooth, with a central basal groove; waist laterally punctated. The four central furrows of the clytra on the upper side indistinctly, the remainder distinctly, punctated, those at the sides at least twice as broad as the ridges separating them and with distinct transverse bacilli. This structure very strongly reminds one of Basilianus cancrus, which is also the largest species of its genus.

Tongue tricarinate, laterally concave. Lower lip convex and smooth, with a small elongately semi-elliptical scutellum between it and the tongue; a small but distinct scar on each side of the lower lip, its branches rather larger, rounded at the ends and somewhat inwardly curved, entirely but not very densely punctated. Prosternal

the same species in the Vienna Museum collection from Amboina (marked *Doleschali*, M. C.) have merely a trace of the middle frontal carina, and the prothorax is comparatively smaller.

Gonates Germarii was received by Mr. W. S. Atkinson from Java-Kaup describes Laches Comptonii from Ceylon. I have not seen it.

15. ACERAIUS GRANDIS, Burm.

This is a very common species in Sikkim, Assam, the Naga and Cachar hills. Indian specimens exactly agree in structure with the large Javanese type form, but their usual size is only 40 m.m., and I never saw one exceeding 45 m.m. In Javanese specimens generally only the ninth and tenth 1 ib of each wing are punctated and hairy near the shoulder, while Indian specimens have, as a rule, the whole of the seventh and ninth rib punctated; it is very rarely that the pits entirely disappear on the seventh.

16. ACERAIUS EMARGINATUS, Fabr.

An extremely variable species, both in general size, as well as in the shape of the two marginal processes of the clypeus; the left one being sometimes sharply pointed at the end, or scarcely bipartite, as in Percheron's pilifer. The seventh and ninth ribs of the elytra are as a rule entirely punctated, very rarely is the seventh smooth. The smaller forms, between 30 and 38 m.m., are, I think, mostly males, they have the furrows of the wings perceptibly punctated; the larger specimens, about and above 40 m.m., appear to be mostly females, the furrows of their elytra are almost devoid of punctations.

The species occurs in Sikkim, Assam, Cachar, but is much rarer than A. grandis. I also obtained it on Penang hill, and from Johore; in the Vienna collections are specimens from China, Luzon, and Manilla.

Redtenbacher's Passalus Nicobaricus from Sambelong (Great Nicobar) is also undoubtedly this species, and neither a Macrolinus nor a Basilianus.

The next genus, Basilianus, is the most numerous in species. I possess specimens of the four species described by Kaup, and three others which I must regard as new. This is as yet almost the only instance in which I have been obliged to transgress Kaup's limit of five species. I took considerable pains to ascertain whether these species could possibly belong to any of the other genera of *Ericonomina*, but they do not answer to the characteristic of any

process between the anterior coxe grooved. Waist, below, smooth, with an elongated scar on either side. Metasternum smooth; on the sloping corners rugosely punctated. Sides of abdominal segments and the posterior part of the last segment mostly finely punctated. No hairs are seen on the elytræ; the middle tibise are moderately hairy, the hind ones somewhat less so.

Habitat-Australia: a single specimen in Dr. C. Felder's collection.

other genus than Basilianus. They differ from Aceraius by the absence of hair at the sides of the elytra, and from the other genera of the Aceraia in the shape of the lower lip and the want of a scutellum between it and the tongue; the same character holds good in a comparison with Mastachilus, and the unequal lappets on each of the antennæ readily separate them from the other Macrolina. The seven species may, however, be divided into two sections, as follows:

- a. With the marginal processes of the clypeus very asymetrical,—Nilgheriensis, inæqualis, Cantoris, Indicus.
- b. With the marginal processes of the clypeus very slightly or scarcely asymetrical,—cancrus, Andamanensis, Sikkimensis.

17. Basilianus Nilgheriensis, Guér.

The usual size of Malabar specimens is only 28 m.m.; it does not appear to be a common species.

18. BASILIANUS IN EQUALIS, Burm.

Common at Melacca. Kaup gives it from Singapore and Penang. The largest specimen which I have examined is nearly 30 m.m., and the smallest 24.7 m.m., the length of the elytra being 13.7, width of head 5.5, of prothorax 6.9, the proportionate size of this last being often remarkably small.

19. Basilianus Cantoris, Hope.

The usual size of Sikkim and Assam specimens is 33 to 35 m.m. Kaup gives it also from Malacca and Cambodja.

20. BASILIANUS INDICUS, n. sp.

Total length from 33 to 40 m.m., one specimen is 37.6, width of its head 9, of prothorax posteriorly 12, of shoulders 11.5, length of elytra 21.5 m.m.

Left jaw slightly straighter and longer than the right one. Upper lip widely and rather deeply emarginate in front. Antennæ, with the three terminal lappets longest and subequal, the second and third about half the length of the fourth, and the first is very short, sometimes scarcely traceable. Clypeus rather large, mostly smooth, or sparsely punctated, with the supraocular ridges anteriorly truncated with an inward slope, the inner edge of the slope being sometimes very indistinct, while the outer one is sharp, and projects at the corners, somewhat as in Aceraius grandis. The horn rises out of a transverse long tubercle, it is subpyramidal, the posterior slope being gradual, the anterior vertical; the frontal carine are very fine, forming together a wide semicircle, each terminating in a blunt tubercle, and from each proceeds a very fine carina to the respective marginal process of the clypeus; the left process is the longer, depressed, inwardly bent, obtuse at the end; the right one is thick, short, obtusely pointed.

The prothorax is moderately convex, as in *Cantoris*; it is conspicuously wider posteriorly than anteriorly, with a central groove which is almost as complete, as it is usually to be found in American forms and in these only; marginal furrow anteriorly somewhat widened, bent in and punctated; lateral scar small, rounded, generally with a few pits; the sides of the prothorax are either quite smooth (in the larger specimens), or punctated in front of the scar and at the anterior corner (in the smaller specimens). Whether this is a distinction of sex I cannot say.

Scutellum centrally very minutely strigated; waist laterally densely punctated. Shoulders slightly thickened, only anteriorly with few very short and thin hairs. Furrows of the elytra, above, slightly, laterally distinctly punctated; without hair.

Tongue tricarinate. Lower lip in the middle somewhat convex, mostly smooth or punctated, anteriorly sometimes slightly indented; its branches densely punctated no scars exist on it. Waist, below, smooth, with elongated diverging, dull scars. Metasternum smooth, its posterior sloping corners rugosely punctated, its sides entirely hairy. Abdominal segments laterally with linear scars.

Prothorax posteriorly, below, covered with brown hair; middle tibiæ very densely, posterior ones less hairy.

Hab.—Nilgheries and Malabar. I received several specimens from Major Beddome, Rev. Baker, and Surgeon Major F. Day.

21. Basilianus cancrus, Perch.

The largest specimen in my collection is 45 m.m. It has as yet only been obtained in Nipál, Sikkim, Bútán, and Assám.

22. Basilianus Andamanensis, n. sp.

Total length 32 to 38 m.m.; one measures 35.6, width of its head 8, of prothorax 10, of shoulders 10.2, length of clytra 21 m.m.

Jaws almost equal. Upper lip straight in front or obliquely truncated, the left rounded corner being often a little more projecting. Lappets of the antennæ generally graduated, the first very short, the succeeding to the fifth gradually longer. Clypeus entirely punctated and covered with short hair; supra-ocular ridges low, distinctly truncated in front and with the carina round the concave space well developed. The horn consists of an elongated ridge, with a small tubercle on either side; it is slightly elevated at the anterior end and with an almost vertical slope. The frontal carinæ are rather short, terminating with elongated distinct points, connected by another carina, from which the margin of the clypeus is almost vertical. The marginal processes of the clypeus are far distant, situated above the edges of the upper lip; they are short, pointed, in some specimens apparently almost equal, in others the left one is distinctly larger. They exactly resemble those

of cancrus, and each also has on its lower side a small tubercle. From both the marginal processes and the frontal tubercles generally proceed a few irregular low ridges to the middle of each supra-ocular ridge.

Prothorax moderately convex, smooth, generally with a very faint indication of a central groove; lateral scar rounded and, like the entire lateral margins, very finely punctated; sometimes there are one or two dots at the anterior corner.

Scutellum smooth, convex, sometimes with a minute punctation along the lateral edges. Shoulders well prominent, and each with a group of short brown hair, considerably more developed than in *Cantoris*. Furrows of the elytra finely punctated; all the ridges smooth.

Tongue tricarinate. Lower lip large, mostly smooth, without any scars; its branches densely punctated. Prosternal carina sharp, long. Waist with elongated diverging scars, sometimes with a short, central, basal groove. Metasternum smooth, its hinder corners sparsely and very finely punctated; sides densely punctated and hairy. Abdominal segments smooth, with linear oblique scars. Middle and hind tibiæ rather thinly hairy; lower sides of prothorax more distinctly so; last abdominal segment at the end provided with conspicuously elongated brown hair.

Hab.—Andamans near Port Blair; Camorta and Katchal islands of the Nicobar group; common. I found one specimen in the Vienna collection, *together with Mastachilus politus, labelled 'Madras,' 'Novara.' It was most likely obtained from some officer who had been at the Andamans, or from the Museum.

23. Basilianus Sikkimensis, n. sp.

Total length 33, width of head 7:1, of prothorax or of shoulders 10, length of elytra 19 m.m.

This species resembles B. Cantoris in size and general character of form and convexity of the body. The jaws are subequal; the upper lip obliquely truncated, almost quite straight, with obtuse corners. The three first lappets of the antennæ much shorter than the three terminal ones, the two sets being among themselves almost equal. Clypeus entirely punctated and very similar to that of B. Andamanensis, but the horn is a little shorter, the frontal carinæ include a slightly smaller semilunar space, and the frontal processes of the clypeus are almost shorter, both pointed, nearly quite equal in size, and each is on the outer side accompanied by a short longitudinal carina, which, however, does not extend to the supra-ocular ridge.

Prothorax moderately convex, with a very faint trace of a median groove; lateral scar rather large, pitted all round, the dots or pits being almost continuous to the anterior corner and here again rather dense; along the lateral margins densely and very finely punctated.

Scutellum smooth. Shoulders moderately developed, on the anterior slope finely punctated and shortly hairy. Furrows of the elytra above distinctly punctated, laterally broader and with transverse bacilli, the seventh and eighth furrow are broadest.

Tongue rather narrow, punctated, thinly tricarinate, laterally concave. Lower lip convex, with sparse punctation, its branches densely punctated. Waist, below, with diverging elongated, dull scars. Metasternum smooth, its hinder corners coarsely punctated, and the narrow sloping sides along the elytræ very finely punctated and hairy.

Abdominal segments with elongated, finely punctated lateral scars, broadest on the first few segments, linear on the penultimate and obsolete on the last. Lower side of prothorax the middle and hind tibiæ with short and rather thinly distributed hairs.

Hab.—Sikkim. I obtained a single specimen at about 1500 feet, some two miles east of Pankabari.

The species is intermediate between cancrus and Andamanensis; with the latter it agrees in the shape and structure of the head, with the former in the transverse costulation of the lateral furrows of the elytra, but in cancrus this costulation is still stronger.

NOTE ON SOME AND AMANESE AND NICOBARESE REPTILES, WITH THE DE-SCRIPTION OF THREE NEW SPECIES OF LIZARDS,—by Dr. F. STOLICZKA.

[Received and read 7th May, 1873.]

I have given a list of the Reptiles and Amphibians, known from these islands, in a former paper,—Journal A. S. B., Vol. xxxix, pt. II, 1870, pp. 136-138 etc.; having, however, lately had an opportunity of visiting all the Nicobar islands (excluding Little Nicobar and Pulo Milu), and the Audamans, including the Cocos and Preparis, I am in a position to add a little information about some of the species. Our visit* was chiefly from an ornithological point of view, and as it fell already in the hot season (March), the time was very unfavorable for collecting reptiles, at least on the northern group of islands, which at this season are much drier than the southern Nicobars.

We found the following species generally distributed over nearly all the islands which we visited:—Tropidonotus quincunctiatus, Lycodon aulicus, Dendrophis pictus,† Cerberus rhynchops and Trimeresurus Cantoris. Spe-

^{*} In company with Mr. A. O. Hume, C. B., Messrs. Ball and Wood-Mason.

[†] In the July number of the Berlin Monatsbericht (for 1872, p. 583), just received, I observe that Dr. Peters describes a *Dendrophis terrificus*, with 13 rows of scales; it is very closely allied to *Dendrophis caudolineatus*, (compare ante p. 123), but differs in coloration.

cimens of *D. pictus* from the Nicobars generally are as soberly coloured as the continental form, while those from the Andamans are very much brighter, but the typical form again occurs on the Cocos.* The rare *Trimeresurus porphyraceus* was found to be common on the Preparis island; it grows to nearly four feet. Of lizards the most common were *Euprepes carinatus*, *Hinulia maculata*, *Cyrtodactylus rubidus*, *Tiaris subcristata* and *Hydrosaurus salvator*. Of Batrachians *Bufo melanostictus* is very common.

Euprepes macrotis, described by Steindachner, was observed in Galthea Bay on Great Nicobar (Sambelong).

The large Andaman form of Euprepes carinatus† is not specifically distinct from the common type. I met with similarly large specimens (up to 20 inches) on the Coco islands. Most of those which I obtained there have thirty rows of scales round the body, and each scale has seven keels, the three median ones being strong and distant from each other, the two laterals on either side short, thin and sometimes scarcely traceable. Some specimens have the anterior frontal in contact with the rostral as well as with the vertical, a short process of the anterior frontal separating the two posterior. The specimens were apparently in breeding dress. The whole sides of the head, neck and belly were vermilion or bright cinnabar red, the anterior extremities and the back were also strongly tinged with red. The entire sides of the body and of the tail and the extremities had numerous large, irregular white and black spots intermixed, giving the lizard quite a different appearance from the ordinary type. The white spots were most numerous along the edges of the back, but there is no marked white band present.

PHELSUMA ANDAMANENSE, Blyth.

Comp. Stoliczka in J. A. S. B., 1870, Vol. xxxix, pt. II, p. 162, and Anderson in P. Z. S. Lond. for 1871, p. 160.

The following is a complete description of this remarkable lizard.

Body rather stout, moderately depressed, tail tapering, narrow at the base, with transverse contractions at distances. Snout almost conically elongated, rostral broader than high, just reaching the upper surface of the head; nostrils lateral, in the hinder edge of an enlarged, somewhat swollen shield, followed by a slightly smaller one; on the upper side the two nasals are separated by two (rarely by three) shields. Head, body and limbs, above and at the sides, covered with equal granular scales, or rather shields,

[•] It is perhaps due to their more isolated situation that the Cocos and neighbouring islands, (Preparis, Narkondam, Barren island), have several Nicobar forms which on the Andamans are apparently wanting. We found Carpophaga bicolor common, Calanas Nicobaricus is said to have occurred on the Cocos, and Megapodius is found on Table island. Among shells I got numerous Helicina, exactly like H. Dunkeri, Bulimus Nicobaricus, var., Cyclophorus, like C. nicobaricus, &c.

[†] J. A. S. B., vol. xxxix, Pt. II., p. 170.

becoming on the tail more depressed, scale-like, and intermixed with a few larger ones. Eye of moderate size, with an almost round pupil; it is surrounded with small granules. Ear-opening ovately rounded, equal to about one third of the longer diameter of the eye. Eight to ten low upper labials. Lower rostral large, somewhat produced and contracted behind. Nine to ten lower labials, the first two are largest, not in contact, the succeeding gradually decrease in size. None of the chinshields are particularly enlarged, and they vary in arrangement in different specimens. The scales of the belly are roundly hexagonal, across the middle in twenty-one to twenty-three longitudinal, alternating series.

The adult male has thirty-one femoral pores, in an uninterrupted series, angularly ascending in the centre. The female has a similar row of enlarged but not perforated shields. Præanal shields not enlarged. A small slit exists on either side in the postanal margin. On the tail the subcaudals become a short distance from the anus enlarged, single, only occasionally broken up into smaller shields. The inner toes on both the fore- and hind-limbs are very short, almost rudimentary; the fourth toe is longest, and all have their front edges rounded.

The general colour in males is grass- or bluish-green, subject to very great changes during the life of the lizard; head and neck with yellowish orange spots and stripes, among which one from behind the eye, one or two across the occiput, and one along the middle of the neck are most conspicuous. The anterior part of the body is on the upper side marked with small, oval, orange spots, on the posterior part these spots are somewhat larger, encircled with yellow, and sometimes partly confluent. All these orange spots often assume during life a strong reddish tint. Tail generally uniform bluish green. The lower side is uniform yellow or yellowish white.

The females are more soberly coloured, particularly when not full grown, in which case the orange spots are much less distinct, and sometimes almost obsolete.

The lower sides of the toes, especially towards their terminations, are silvery grey.

The usual size of full grown males is five inches, head and body being two; specimens of six inches are great rarities. The females are generally somewhat smaller than the males.

The species is not uncommon about Port Blair. I found a few on old trunks of trees (between epiphytes) on Mt. Harriet. They generally hide themselves under the bark of trees, but also often feed on the ground. Mr. Wood-Mason about a year ago brought a large number of specimens from the vicinity of Port Blair. I have not seen specimens from any of the other islands.

GYMNODACTYLUS WICKSII, n. sp. .

A small species, resembling in general character some of those described by Jerdon and Beddome from South India. The body is moderately slender and depressed, covered with very small, keeled tubercles which have the appearance of pointed granules; on the back there are numerous larger, but similarly formed, tubercles interspersed, and on the side of the belly there larger tubercles become distinctly spinulose; tail verticillate, with similar spinules, exactly as in Hemidactylus frenatus. On the snout the sharp granules are, as usually, somewhat larger than on the top of the head, but none are enlarged above the labials. The rostral reaches to the upper side of the snout, and is followed by two small shields, separated by a still smaller pentagonal azygos, the upper angle of which fits into a posterior emargination of the rostral. The nostril is lateral and directed somewhat backwards, it lies immediately behind the rostral, and is followed by two slightly enlarged and diverging shields, the anterior angles of which nearly touch the rostral, thus almost entirely isolating the nasal opening from the first labial and the shield behind the rostral. No particularly enlarged scales round the eye. Seven upper and lower labials, the first are in each case the longest, the succeeding gradually decrease in size, the last are very small; all are very low. Ear opening forms an oval, oblique slit, its distance from the eye is slightly less than that from the eye to the end of snout. Lower rostral large, obtusely pointed behind, followed on each side by a slightly enlarged shield, separated by smaller ones; there are no particularly enlarged chin-shields. The scales on the throat and anterior breast are finely keeled; those on the belly hexagonal and across the middle in about nineteen longitudinal series. Præ-or post-anals not enlarged. Sub-caudals along the middle line very little larger than the other shields covering the lower side. Reproduced portions of the tail are uniformly scaly, without enlarged tubercles.

The male has four præ-anal pores, situated between the femora in a shallow transverse depression, and quite separate from these are four or five femoral pores placed at the hinder lower edge of the femur, somewhat nearer to the hip than to the knee. Toes long and slender; basal portion with three or four transverse, squarish plates; the last the largest; terminal phalanges very much parrower.

Colour. Above, powdered brownish grey and white, a series of whitish, almost continuous spots along the middle of the back, extending on to the tail. There are six or seven of these spots from the nape to the base of the tail, and each of them is edged anteriorly and laterally with black, sometimes the lateral black edges develope into elongated spots and are. most distinct. On the tail the white spots are less distinctly developed, but the transverse black margins well marked. The sides of the body, of the tail

and the upper side of the limbs is thinly checkered with black; the enlarged spinules and tubercles are all pure white. There is a dark streak between the snout and the eye, posteriorly there are three dark lines, one going to the occiput, the second to the ear, the third to the angle of the mouth; and generally there are one er two more below the eye, giving the side of the head quite an ornamental appearance. Labials spotted with white. Chin and throat powdered with brownish dusky, remainder of lower side uniform pale, more or less distinctly tinged with fleshy; in males more markedly so than in females. In the very young lizard (about one inch long) the lateral black spots along the back, and the median black line behind the eye are most distinctly marked, in other respects it does not differ from the adult.

Hab.—Preparis Island. I obtained five specimens, two apparently adult males and two females, and one young; all were found on the ground between old decaying vegetable matter. One of the largest specimens with perfect tail, measures: head and body $1\cdot13$, tail $1\cdot37 = 2\cdot5$ inches. The length of the hind limb equals the distance from the shoulder to the groin.

I have great pleasure in connecting with this very interesting new species the name of the able Commander of the "Scotia," Capt. G. W. Wicks, who piloted us most skilfully through the labyrinth of small and large islands.

MOCOA MACROTYMPANUM, n. sp.

Body moderately slender, head flattened above, muzzle rather attenuated and prolonged. Anterior frontal in contact with the rostral, separating the two elongated nasals, and posteriorly just touching the vertical, which is rather shortly, obtusely angular in front, and gradually attenuated behind. Four enlarged supraciliaries, preceded and followed by a smaller shield. The two anterior occipitals (? accidentally) united, the median one roundly angular in front, attenuated and contracted behind, the two laterals narrow. in contact with each other behind the median shield. Four pairs of scales behind the occipitals enlarged, occupying the whole width of the neck. Seven upper labials, the fifth under the orbit, six narrow lower labials. First chin-shield single, the second is a pair in contact, third separated by a small shield, fourth pair somewhat smaller. Lower eyelid with a transparent disk. Ear opening very large, rounded, with a perfectly smooth edge all round, the tympanum being distinctly visible. Body in the middle surrounded by twenty-two longitudinal series of smooth scales, six series being on the back; they are slightly larger than those at the sides. About fifty-two scales along the edge of the lower side, counted between the fore and hind limbs. A pair of moderately enlarged præ-anal shields. Median row of sub-caudals slightly enlarged. Limbs proportionately developed, with the toes very slender.

Head above brown, paler on the muzzle; three longitudinal white bands along the body,—one along the middle, originating between the eyes, and two along the sides, beginning on the supraciliary edges;—they are separated, above, by two somewhat broader brown bands, each being lighter coloured along the centre, and bounded at the sides by a similar brown band which is, however, darkest along the centre. The median dorsal white band becomes obsolete at the root of the tail, the two lateral ones continue on it, and unite when approaching the tip. Labials and sides of head brownish, spotted with white. Lower portion of the sides and the entire lower surface livid carneous, most distinctly so, and tinged with bright orange, on the lower belly and on the tail, which is also on the upper side carneous, with a few white dots at the side of the base, and irregularly marked with pale brown on the lower surface. Limbs, above, with very close longitudinal brown lines, toes all distinctly powdered with pure white.

Total length four inches, the head and body being 1.8, the length of the fore limb is equal to the distance between the shoulder and the angle of the mouth, or one-third of the distance between the axil and the groin; the length of the hind limb is one-half of the same distance.

Hab.—South Andaman. The single specimen was obtained on a sandy beach in Macpherson's Struts.

TIARIS HUMEI, n. sp.

A larger species than *T. subcristata*, and like this one with the crest interrupted above the shoulders, but the crest itself is very much more developed. The nuchal part is considerably higher than the dorsal one, on its convex edge it is composed of 13-15 lobes; the dorsal portion continues on to the tail, disappearing after about one-fourth of its length. None of the scales are at the lateral bases of the crest particularly enlarged. All scales on the body are distinctly and sharply keeled.

Head shelving and concave above; snout with a few enlarged scales along the centre; supraciliary edge sharp, its posterior end is separated by a short groove from a small tubercle following it. Two groups of enlarged conical scales on the upper side of the occiput; several (3-4) enlarged scales on the side of the head above the tympanum which is hardened near the centre, and about as large as the eye. Below the tympanum no scales are enlarged. Eight or nine upper labials and seven or eight lower labials; the scales adjoining the former are enlarged, and there is also a conspicuous row of slightly enlarged scales below the eye. A row of enlarged scales is separated from the lower labials by one of small scales. Scales on the side of the neck and body very small, arranged in somewhat irregular transverse series, with scattered larger ones intermixed; on the tail they gradually increase in size, but within a short distance of its base still have some

larger ones intermixed. On the limbs the scales are much larger, two or three on the upper side of the femora particularly so. 'Gular pouch and fold covered with small scales, which become larger on the lower belly than on its sides. The two rows of sub-caudals are slightly larger and more pointed than the shields on the upper side of the tail.

General coloration greenish olive, on the top of the head brownish; sides of the entire body more or less distinctly and rather densely reticulated and spotted with black and yellow; sides of head and neck and the gular sactinged with purplish blue, labials spotted with blue. Chin mostly yellow; belly whitish, without spots. Tail brownish above, paler below, irregularly and indistinctly spotted with dusky.

Total length of one specimen 16 inches, of which head and body are 4.4 and the tail 116 inch. The fore limb when laid backwards extends beyond the groin, or almost to the præanal edge, and the hind limb when laid forwards fully reaches the anterior edge of the eye.

The above noticed characters readily separate the Nicobar species from *T. dilophus*, or *T. tuberculatus*, lately (P Z. S. 1872, p. 533, pl. xxxviii) described by Dr. Günther from the East Indian Archipelago.

I obtained only two specimens (male and female) on the Nicobar island Tillingchang, but the species did not seem to be rare.

DIBAMUS NICOBARICUS, (Fitz.).

Rhinophidion nicobaricum, Fitz, Steindachner, Novara Rept. p. 52 and Typhloscincus nicobaricus, ibidem, p. 94.

I have two specimens for examination, one a male* and the other a female (known from dissection).

The male is six inches of which the tail is 0.9 inch; there are 24 longitudinal rows of scales round the body, and 48 transverse rows along the tail. The two extremities are on either side somewhat in front of the anus, towards which they converge; they are depressed, each lying in an oblique cavity, the intermediate space of the sacral region being flat, triangular and pointed above the anus. Each extremity is fully as long as the whole head,† it is covered on the upper side by three longitudinal rows of scales, narrowing towards the end which is occupied by a large, flat, nail-like scale.

The body of the female is somewhat stouter; it measures 5.5 inches, of which the tail is only 0.5 inch. The body is again surrounded by 24 longitudinal and the tail by 34 transverse rows of scales. On each side in front of the anus is an enlarged scale, separated by three small scales from the anal edge, and just in the place where the extremity in the male originates;

This is in the Indian Museum and I am indebted to Dr. Anderson for the opportunity of examining it.

[†] In D. Nova-Guinea the extremity is only as long as the head is broad.

this large scale covers a small opening, in which internally a rather strong muscle terminates; the muscle is most probably emissible and retractile at the will of the animal.

All other characters are common to both sexes. The upper labial is separated from the rostral by a distinct groove. The shields are dark brown, almost blackish, with paler edges; paler below. The shields on the head are yellowish and there are occasionally yellowish spots on the chin and throat, or on the lower side of the tail.

As compared with Typhloscincus Martensii, Peters, the snout of the Nicobar species is narrower, the head posteriorly broader, the eyes, although covered by skin, distinctly traceable, all points to which Steindachner drew attention when comparing the two, but the shields of the head, the number of scales round the body and on the tail are in both species quite the same. There is in T. Martensii also an enlarged scale above the anal edge, but it is nearer to it than in the Nicobar species. Still, if it were not for Peters' distinct statement, that out of three specimens of T. Martensii two are males, and one a female, both without any trace of extremities, I should have considered the specific distinction of the D. Nicobarious from T. Martensii somewhat doubtful. The coincidence is certainly remarkable.

Dibamus was characterized by Dumeril and Bibron (Erpet. gen. v. p. 833) from two New-Guinean specimens, sent to them by Prof. Schlegel. Both specimens were apparently males, but Schlegel* says that these only possess a pair of posterior extremities, the females having none. And this is strictly in accordance with the observation made on the two Nicobar specimens.

Descriptions of fwo new species of Indian Landshells, by Dr. F. Stoliczka.

[Received 7th May, 1873.]

The following descriptions have been drawn up with the view of supplementing the figures of them which are to be given by Mr. Theobald in the 'Conchologia Indica.' The first species is from the Shan-states, and was collected, several years ago, by Mr. Fedden; and the second was given to me by Mr. Foote who obtained it in the cotton soil district near Bolgaom, when on his geological tour.

[•] Comp. Berlin Akad. Monatsberichte for 1864, p. 271.

PLECTOPYLIS SHANENSIS, n. sp.

Pl. testa planorbulari, pallide fusca, apice minutissime exserto, pallido; anfractibus $6\frac{1}{3}$, angustis, sutura indistincte marginata junctis, primis $2\frac{1}{3}$ ad tribus minute rugulosis, cæteris transversim oblique striatis atque concentrice obsolete striolatis, ultimo ad peripheriam subrotundato, infrå paululumangustiore, ad aperturam modice deflexo; umbilico spatioso, anfractus omnes sutură distincte marginată separatos exhibente; apertura angulum circiter 55° attinentem cum axi formante, peristomate undique expansiusqulo atque inorassato, margaritaceo lutescente, circumdata, ad utranque terminationem labii subangulati profunde incisa; labio plicis tribus distinctis instructo, plica mediana crassissima, ea atque infera multo tenuiore usque ad peristoma extensis, tertia interposita a margine remote evanescente, sed usque ad laminam internam verticalem, circiter tertiam partem unius circuitus a margine aperturali distantem, extensa; ultimo anfractu intus supra laminam verticalem antice plicis sex crassiusculis, postice plicis decem brevioribus atque tenuioribus instructo.

Diam. maj. 21.5, min. 17, alt. 6.5; diam. aut alt. aperturæ 7.5 m.m. Dimensiones speciminis secundi minoris sunt: 18.5, 15, 5.8, 6.6 m.m.

Hab .- Provinciam Burmanam 'Shan-states' dictam.

This *Plectopylis* is readily distinguished from its allies by the presence of three labial plice, the strongest being in the middle and extending, like the lower thin one, to the edge of the lip, while the intermediate one disappears before it reaches the aperture, but it is the only one which extends to the internal almost vertical lamina. This last is superseded anteriorly by six stronger and posteriorly by ten thinner and shorter folds, but there is no corresponding lamina present on the inner side of the last whorl.

In external shape and character of volution the species is almost identical with *P. repercussa*, except that in this latter all the whorls are transversely striated on the upper side, and the last at the aperture a little more deflected, the umbilicus also appears to be a little wider, and not only the plices at the mouth but also the internal lamines are totally different in repercussa; in this one there are two internal lamines on the inner lip one behind the other, and one on the outer lip projecting in the space bounded by the two others.

TRACHIA FOOTEI, n. sp.

Trach testa albida, orbiculata, supra deplanata, infra inflata, versus medium angustata, perspective modice umblicata, undique dense granulifera; anfractibus 4 ad 45, gradatim accrescentibus, primis duobus aut tribus conoexiusculis, transversim etriatis, cateris magis deplanatis, transversim costulis inaqualibus et obliquis ornatis, ultimo ad peripheriam valde carinato, costulis in carina evanescentibus, ad aperturam valde descendente atque fore

omnino deflexo; basi circa umbilicum rotundate subangulata, similariter costulata, costulis usque ad peripheriam extensis; apertura fere horizontaliter deflexa, transversim rotundate elliptica, margine dilatato fere undique libero, ad angulum umbilici angustissime adnato, circumdata. Diam. maj. 13.3, d. min. 11.2, altitudo totius testæ 6; altitudo apert. cum peristomate 5.5, ejusdem latitudo 6.8 m.m.

Hab.—Belgaom, India occidentali.

The present species has to be placed in close proximity to *T. crassicostata*, and is as closely allied to it as this is to *T. fallaciosa*. It differs very markedly from *crassicostata* by its more distinctly orbicular and depressedly planorboid shape, by a well marked, smoother and thinner, peripherical keel on the last whorl, by a more inflated and towards the middle more contracted base, it being angular round the umbilicus, and by a considerably more deflected aperture.

In a former paper* I expressed a doubt about *H. fallaciosa, ruginosa*, and nilghirica belonging to the genus Trachia, as originally proposed by Albers. I observe, however, in well preserved specimens, that all of them possess the peculiar granular structure which is so characteristic of Trachia. T. crassicostata and Footei must now be added to the list of these closely allied Western Indian species.

ON RIIOPALORHYNCIIUS KRÖYERI, A NEW GENUS AND SPECIES OF PYCNO-GONIDA,—by James Wood-Mason, of Queen's College, Oxford.

[Received and read May 7th, 1873.]

(With plate XIII.)

Much difference of opinion has prevailed with regard to the systematic position of the *Pycnogonida*, as to whether they should be classed with the Crustacea or with the Arachnida. By one set of naturalists, including Johnston, Milne-Edwards, Quatrefages, Kröyer, and Dana, they have been placed with the Crustacea; by another—including Latreille, Erichson, Gerstaecker and Huxley who separates them, as well as the Tardigrada and Pentastomida, from the typical Arachnida (Spiders, Mites and Ticks) as an aberrant order,—with the Arachnida. Dr. Anton Dohrn† who has recently studied the embryology of these animals finds that they are in no way related to the Arachnida, that they resemble the Crustacea in having anaupliiform first developmental stage, but that from this point the course of development ceases to exhibit anything in common with that of the Crustacea; under these circumstances I have thought it better to call the cheli-

^{*} Journ. A. S. B., Vol. XL, Part II, p. 224.

⁺ Jenaische Zeitschrift, 1869.

ceræ, palps, and accessory legs (= mandibles, and 1st and 2nd pairs of maxillæ of Kröyer) of those who range the Pycnogonida with the Arachnida, the first, second and third pairs of cephalic appendages respectively, thus avoiding the use of terms implying affinities and homologies that may not in reality exist.

RHOPALORHYNCHUS,* gen. nov. Wood-Mason.

Corpus lineare, gracillimum, annulis thoracis perdistinctis, cylindricis, utrimque dilatatis, processibusque lateralibus magnis, obconicis. Rostrum uniarticulatum, elongatissimum (corporis longitudinem pæne æquans), clavatum, ore triradiato. Annulus oculiger in collum vix coarctatus. Appendices cephalicæ primi paris absunt. App. ceph. secundi paris temuissimæ, rostro longiores, novemarticulatæ, articulis secundo tertioque elongatis; app. ceph. tertii paris paulo longiores, ex decem confectæ articulis,—quorum tertius quintusque sunt clongatissimi, terminalesque quatuor prehensiles ac margine interiori serrati ciliatique—in utroque adsunt sexu; appendices utriusque paris, secundi ad tertium, tertii ad quartum articulum, sunt geniculatæ. Tuberculus oculiger in postica annuli parte est situs. Pedes gracillimi, inermes, cquales, corpore (rostro incluso) duplo longiores, unguibus auxiliaribus armati sunt nullis. Abdomen uniarticulatum, obtuse-conicum, perbreve, vix distinguendum.

RHOPALOBHYNCHUS KRÖYERI, n. sp.

Body linear, smooth. The rostrum is almost as long as the rest of the body, moveably articulated to the middle of the anterior end of the oculigerous somite, slender and filiform nearly to its middle whence it expands and finally narrows to its obtuse extremity; when examined in profile, the convex upper contour of the expanded portion is seen to carry two minute forwardlydirected spines, the one behind the other in the middle line. The mouth is situated at the extremity of the rostrum and has the form of a triradiate slit, the three slits being so disposed that a circle described from the point in which they meet so as to pass through their free extremities would be by them divided into three equal sectors. The ocular tubercle is erect, occupies the posterior half of the segment on which it is placed, and has the form of a short cylinder surmounted by a minute cone, the eyes being situated partly on the cylinder and partly on the cone at points corresponding, as usual. to the extremities of the arms of a St. Andrew's cross. A very distinct crescentic suture, bounding the base of the ocular tubercle posteriorly and curving forwards and outwards so that, if produced far enough, it would pass

^{*} βόπαλον, clava; βύγχος, rostrum.

out just in front of the first pair of legs, divides the oculigerous from the first thoracic somite.

The cephalic appendages of the first pair are absent. Those of the second pair are about 13 times as long as the rostrum with which they lie in the same horizontal line, being articulated one on each side of it to the anterior end of the oculigerous somite, are filiform, excessively slender, and composed of nine joints. The first joint is subglobular, being nearly as broad as long, much broader than any of the succeeding joints; the second greatly clongated and slightly expanded at the apex; the third is very short and slightly curved; the fourth is greatly clongated, but not so much so as the second; the fifth is shorter than either of the four equal terminal joints which, together with the fifth and the distal half of the fourth, are fringed with short and very delicate cilia. Those of the third pair are also extremely slender, are articulated, a little posteriorly and internally to the second pair, to minute processes springing from the ventral arc of the oculigerous somite and meeting in the middle line. They are composed of ten joints, of which the first is minute, the two next equal and cylindrical, the third greatly elongated and just perceptibly expanded at the apical end; the fourth short, scarcely longer than the second of the two basal joints, and curved; the fifth is likewise greatly elongated, but more expanded at the apex and longer than the third; the four terminal joints are short, slightly decrease in length from the first to the last which comes suddenly to a subacute incurved point forming a sort of claw, are curved, fringed on their inner and concave margins with cilia and minute spinules, and capable of being coiled tightly together so as to form a prehensile organ.

Both pairs of appendages are elbowed at a short joint, intercalated between two long ones, viz., the second pair between the 2nd and 4th, the third between the 3rd and 5th joints.

In many other species the terminal joints of the third pair of cephalic appendages (pedes accessorii) will probably be found to be similarly modified as a prehensile organ; an examination of O. F. Müller's faithful figures of Nymphon grossipes, Fabr. in the Zoologica Danica* would, in fact, alone suffice to show the existence of such a modification in that species, even if Kröyer† had not described it in his diagnoses of the genera Nymphon and Zetes, without, however, offering any interpretation of the structure.

The oculigerous somite has its anterior margin straight, and is but faintly constricted in front of the eye-tubercle.

The first thoracic somite, if its distinctness from the oculigerous somite be admitted, is very short. Of the remaining somites, the second and third are subequal, the former being if anything the longer; are as perfectly cylindrical,

[#] Op. cit., pl. cxix, figs. 5 et 8.

[†] Naturhist. Tidssk., 1844, pp. 108 et 116.

and nearly as long as, but slightly stouter than, the filiform proximal moiety of the rostrum; and are suddenly expanded at their articular ends, each somite presenting the appearance of a cylinder with a greatly truncated cone affixed by its truncated surface to each end. The fourth and last somite is scarce half the length of those that precede it, and is similarly expanded at its anterior end only. From the sides of the expansions at the posterior extremity of the 2nd and 3rd spring two somewhat inflated outwardlydirected, obconic processes which might, at first sight, be mistaken for the first of the basal joints of the legs from their close similarity to these, but which are in reality one with the somite from which they arise: precisely similar processes carry the legs both of the first and of the last somite in which, however, they diverge like the arms of the letter Y. Wedged in between the roots of these processes of the last somite and the posterior boundary of its ventral arc, lies a minute, obtusely-conical tubercle with a large circular (anal) aperture at its extremity. This is the abdomen, a very evident, though rudimentary, structure in most Pycnogonida and even biarticulate in one species (in Zetes hispidus, Kröver), but here so reduced in size as to be quite invisible from above, and only demonstrable with difficulty from below whence it appears, in ordinary positions, under the microscope as a convex, ovoidal or heart-shaped plate. It, moreover, looks downwards and slightly backwards, instead of upwards and backwards or directly backwards as it usually does.

The legs are long, slender, simple, equal in length, rather more than twice as long as the body including the rostrum, and are composed of eight joints, terminated by a weak, slightly curved claw. Their three basal joints are as broad as long, equal, and almost globular; the fourth is club-shaped at the distal end; the fifth is all but as long as the fourth and, with the remaining joints, perfectly filiform; the sixth is shorter and about twice the length of the two last together; these are subequal.

Length	of the	body including the rostrum,	13 mm.
,,	,,	legs,	26 mm.
,,	"	2nd pair of cephalic appendages,	10 mm.
"	,,	3rd " " "	12 mm.

From the linear from of the body and the slenderness of the legs, I conclude that my specimen is a male, a conclusion by no means invalidated by the presence of the third pair of cephalic appendages, which, being apparently invariably developed in both sexes throughout several genera, (Nymphon, etc.) consequently possesses no value in the determination of questions of sex.

Hab.—Dredged by the writer at Port Blair, Andaman Islands, in 25 fathoms of water, at which depth the bottom was clothed with a dense

tangle of delicate, filamentous algæ so closely resembling the animal in point of colour and form, that the latter was with difficulty distinguishable.

In conclusion, I dedicate the first species of Pycnogonida hitherto discovered in these seas to the memory of the illustrious Danish naturalist whose name is so indissolubly connected with the history both of the Pycnogonida and of the lower Crustacea.

Explanation of Plate XIII.

- Fig. 1. Rhopalorhynchus Kröyeri, nat. size.
- Fig. 2. The same greatly enlarged.
- A cephalic appendage of the second pair, greatly enlarged. Fig. 3.
- Fig. 4. " " " third "
- Fig. 5. Rostrum scen from the side 11 a = mouth.

ALGE* COLLECTED BY MR. S. KURZ IN ARRACAN AND BRITISH BURMA, DETERMINED AND SYSTEMATICALLY ARRANGED by DR. G. ZELLER, High Councillor of Finance in Stuttgart.

(Communicated by Mr. Kurz.)

[Received 3rd May; read 1th June, 1873.]

DIATOMACEÆ.+

*1. Podosiba Kurzii, Z., n. sp.

Stipiti brevi cylindrico adnata; cellulis sphæricis, v. oblongis et diametro paulo longioribus; 1/175 ad 1/150 lin. crassis; 2 et pluribus isthmo brevi concatenatis, lævibus, valvulis ad commissuræ margines nodulis binis minutis instructis. Arracan, Akyab, in rupibus marinis submersis (3280. 3283.)

CHROOCOCCACEÆ.

*2. Chroococcus minor, Ng. (Protococcus minor, Kg.).

Pegu, Elephant-point, in rhizophoretis ad corticem Sonneratie apetala. (3277).

- * The arrangement is according to Rabenhorst's Flora Europea Algarum, that of the sea weeds according to Kutzing's Species Algarum. The numbers within brackets refer to Mr. Kurz's collections. Those species marked by an asterisk are new additions to Burmese phycology (see a paper on Burmese Algæ by the late Dr. G. von Martens, Journ. A. S. B., Vol. XL., 1872, p. 461 sq.)
- + The diatoms from Burmah (about 60 or more species) are not yet distributed; Dr. L. Rebenhorst of Dresden has, however, been kind enough to undertake the determination of them. (S. Kurz.)

*3. Curoococcus Indicus, Z., n. sp.

Strato gelatinoso, tenui, pallide fusco; cellulis singulis solitariis, oblongis v. globosis, 1/700—1/300 lin. crassis, virescentibus; tegumento hyalino, vix conspicuo, cytiodermate achromatico, cytioplasmate granuloso. In stagno silvatico ditionis Prome (3151).

*1. CHROCCCCUS GRANULOSUS, Z., n. sp.

Strato gelatinoso, granuloso, aurantiaco; cellulis 4-12 et pluribus in familias circiter 1/100 lin. crassas associatis, 1/500—1/300 lin. crassis, v. singulis ad 1/160 lin. crassis, globosis v. angulosis; tegumento tenerrimo, hyalino; cytiodermate hyalino, in cellulis junioribus vix conspicuo, in adultioribus crassiusculo; cytioplasmate aureo-fusco, rarius viridi. Pegu, in valli alluviali fluminis Irrawaddi versus Thabyrogon, in rivulo exsiccato (3223).

*5. APHANOCAPSA ALBIDA, Z.. n. sp.

Thallo tenui, membranacco, amorpho, sordide albido; cellulis globosis, 1/700—1/600 lin. crassis, nunc solitariis, nunc seriatis aut acervatis; tegumentis diffluentibus; cytioplasmate homogeneo, pallide aerugineo. Arracan, Akyah, in stagnis salsis putrescentibus fluitans (3284).

*6. SYNECHOCOCCUS FUSCUS, Z., n. sp.

Cellulis singulis, interdum duabus v. tribus longitudinaliter seriatis ellipticis, utraque fine rotundatis, 1/100 lin. longis, 1/250 lin. crassis; cylioplasmate fusco v. lutescente, homogeneo. Pegu, in montibus Yomah dictis secus rivulum Thit-Kouk (Pazwoondoung) in limo arenoso (3258).

LEPTOTHRICHEÆ.

*7. LEPTOTHEIX OCHRACEA, Kg.

Pegu, in variis locis præsertim in montibus Yoma frequentissime e fissuris rupium humidarum protrudens et massas $1-1\frac{1}{2}$ poll. crassas ochraceas formans. In collectione hæcce prostant stationes: Kadeng-choung ad Natmadhee (3232/a); Thayet-choung inter Kya-Eng (Eng = laculus) et Phounggyee, (3277); Wha-choung (choung = rivulus, fluvius, etc.) in stagno sylvatico (3287/a); Mui-how in montibus (Yomae meridionalis) in fonte (3240).

*8. HYPHEOTHRIX ERUGINEA, Rabenh. (Leptothrix, Kg.).

Pegu, Phoungyee, ad ripas laculi in limo (3186/a) var. subtorulosa, Z. articulis ad genicula interdum parum contractis. Pegu, Kenbatee-choung in fonte ad vicum (3131).

*9. HYPHEOTHRIX CALCICOLA, Ag. b. muralis (Leptothria muralis, Kg.) Pegu, Henzadah, ad muros ædis cujusdam vetustæ lateritiæ. (3167). *10. HYPHEOTHRIX SUBTILISSIMA, Rabenh. (Leptothrix, Kg.).

Pegu, in muris humidis muscosis cisternæ in vico Tharawa, in vicinitate oppidi Henzadah (3214/a, 3223/a, 3223/b).

*11. HYPHEOTHRIX VIRIDULA, Z., n. sp.

Strato tenui, membranaceo, obscure ærugineo-viridi; filis parum curvatis, dense intricatis, ad 1/750 lin. crassis, apicem versus attenuatis, ærugineis, obsolete articulatis, interdum torulosis; articulis diametro parum v. ad duplum longioribus; vaginis delicatissimis, arctis. Pegu, in palude prope Wanet, in limo et in plantis aquaticis. (3238).

OSCILLARIEÆ.

- *12. OSCILLARIA ANTILLARUM, Kg.
- Arracan, Akyab, in stagnis subsalsis. (3216).
- *13. OSCILLARIA ANTLIARIA, Juerg. a physodes. Ibidem (3216).
- *14. OSCILLARIA BREVIS, Kg.

Pegu, Kadeng-choung ad Natmadhee. (3134).

*15. OSCILLARIA CHALYBEA Mert., var. Indica, Z.

Strato obscure chalybeo, filis tantummodo 1/400—1/375 lin. crassis. Pegu, in locis humidis limosis viæ inter Kyauzoo et Wachoung (3185).

*16. OSCILLABIA GRATELOUPII, Bory.

Pegu, Elephant-point, in aquis dulcibus (3275).

*17. OSCILLARIA SANCTA, Kg.

Pegu, Tharawa, non procul ab Henzada, in muris humidis cisternæ (3214/a, 3223).

- *18. OSCILLARIA VIOLACEA, Wallr. (O. fenestralis, Kg.) Rangoon in limo aquæ dulcis. (3208).
- *19. OSCILLARIA VIRIDULA, Z., n. sp.

Strato membranacco, viridi-œrugineo, longe radiante; filis læte ærugineis, rectis, 1/500—1/450 lin. crassis, apice ad dimidium attenuatis et leviter curvatis, subtilissime granulatis; articulis obsoletis, diametro duplo brevioribus. (O. Neapolitanæ proxima). Rangoon, in limo aquee dulcis (3206).

- *20. PHORMIDIUM ARENARIUM, Rabenh. (*Ph. thinoderma*, Kg). Arracan, Akyab in limo aquæ subsalsæ (3220, 3286/a).
- *21. PHORMIDIUM INUNDATUM, Kg.
 Pegu, Tharawa, prope Henzadah, in muris cisternæ (3228 /b).

*22. CHTHONOBLASTUS LYNGBYEI, Kg.

Arracan, Akyab, in rupibus marinis inundatis (3285).

*23. CHTHONOBLASTUS BURMANICUS, Z., n. sp.

Filis 1/1500 lin. crassis, ærugineis v. lutescentibus, indistincte articulatis, parum flexuosis, apice attenuatis, in fasciculos pallide fuscos, 1/300 lin. crassos, flexuosos, contortis; vaginis ad 1/100 lin. crassis, pellucidis, fibrillosis, margine undulatis. Pegu, Tharawa prope Henzadah, in muris cisternæ (3214b).

*24. CHTHONOBLASTUS KURZII, Z., n. sp.

Litoreus, strato nunc obscure chalybeo, nunc luteo-viridi, filamentoso; filis 1/400—1/300 lin. crassis, violascentibus, v. pallide ærugineis, numerosis, in fasciculos laxe contortis, apicibus attenuatis, obtusis; articulis plerumque obsoletis, diametro ad triplum brevioribus, rarius granulatis; vaginis 1/90—1/50 lin. crassis, sordidis, hyalinis, interdum transversim striatis. Pegu, Elephant-point, in rhizophoretis in linnosis ad arborum radices et ad algas majores maritimas (3273,3274).

*25. LYNGBYA PALLIDA, Z., n. sp.

Pallide viridis, adnata, filis 2-4 pollicaribus, cespitosis, flexuosis, luteis v. virescentibus, cum vagina lævi, achromatica, 1/60 lin., sine vagina 1/70 lin. crassis; articulis diametro 3-5plo brevioribus, subtilissime granulatis. Pegu in montibus Yomah, Wathabwot-choung in saxis arenosis submersis (3175).

*26. HYDROCOLEUM MENEGHINIANUM, Kg.

Pegu, Elephant-point, in rhizophoretis, ad radices et arborum truncos submersos. (3263).

*27. HYDROCOLEUM STRIATUM, Z., n. sp.

Rivulare, semipollicare, ærugineo-nigrum; vaginis 1/90 lin. crassis, transversim striatis, striis in 1/100 lin. 9; filis inclusis plerumque ternis, leviter contortis, 1/180 lin. crassis, dense granulatis, continuis, vel obsolete articulatis; diametro multo brevioribus. Pegu, in rivulo vadoso prope Sanyæ-wa ditionis Rangoon (3200).

*28. STROCOLEUM INDICUM, Z., n. sp.

Cespite parvulo, vix semiunciali, viridi; vaginis a basi 1/60 lin. crassa ad 1/250 lin. attenuatis, achromaticis; filis initio pulchre ærugineis, apice obtusis, obsolete articulatis, articulis diametro æqualibus, 1/750 lin. crassis, deinde pallidioribus et divisione longitudinali et transversali in gonidia 1/1500 lin. crassa, seriata, diametro 2-4plo longiora, collapsis. (Sirocoleo

Gujanensi affine, sed multo tenuius. Genus accuratius observandum). Arracan, Akyab, in rupibus maritimis inundatis (3280).

*29. SYMPLOCA KURZIANA, Z., n. sp.

Lignicola, pollicaris et ultra, griseo-æruginea, fasciculis strictis, densis, basi coalitis: filis rectis, pallide ærngineis, subtiliter granulatis, continuis vix hine inde obsolete articulatis, cum vagina 1/375 lin. crassis; vaginis achromaticis, arctis, superne sæpe vacuis. Pegu, in fundo naviculæ fluminis Myitnan ad Thabyægon (3222).

*30. SYMPLOCA LUTESCENS, Z., n. sp.

Lignicola, semipollicaris, vix ultra, fasciculis basi viridi-ærugineis, apicem versus lutescentibus, dense cæspitosis; filis pallide ærugineis, apice evaginatis, granulatis, sine vagina 1/450—1/300 lin. crassis; articulis obsoletis; vaginis rigidis, achromaticis, ad 1/175 lin. crassis. Pegu, in planitie alluviali fluminis Irrawaddi, in fundo naviculæ, qua fluvium Lhein prope Beendau-Hseat transiit cl. Kurz (3160).

NOSTOCHEÆ.

*31. Nostoc ellipsosporum, Rabenh. (*Hormosiphon*, Desmaz.) var. vaginis achromaticis.

Prome, in montibus Yomæ, inter muscos secus declivia rivuli Whay, dho (3178).

- *32. NOSTOC GRANULARE, Rabenh. (*Hormosiphon*, Kg.). Pegu, Elephant-point, in aquis dulcibus stagnantibus (3291).
- *33. NOSTOC PURPURASCENS, Kg. (N. rufescens, Ag., forma purpurascens). Pcgu, Kadeng-choung ad Natmadhee, natans (3230).
- *34. Nostoc rivulare, Kg.

Pegu in montibus Yomæ, Koon-choung ad saxa arenosa humida (3176).

*35. Nostoc heterotheix, Z., n. sp.

Strato irregulariter expanso, olivaceo-viridi; filis leviter flexuosis, inæqualibus; alteris ærugineis, articulis globosis, 1/600—1/450 lin. crassis, cytiodermate vix conspicuo hyalino; alteris fuscis, cytiodermate evidenti, colorato, articulis globosis v. ellipticis, ad 1/175 lin. crassis; cellulis perdurantibus ellipticis, ceteris paulo majoribus. (Forsan *Hormosiphon heterothrix*, Kg.?) Pegu, in valli Pazwoondoung, in rivulo Bala-choung (3196); secus declivia limosa fluminis Irrawaddi ad Khyoung-gyee (3163).

*36. · NOSTOC KURZIANUM, Z., n. sp.

Terrestre, thallo fusco-atro, irregulariter expanso, membranaceo; filis densis, parum curvatis, fulvis; articulis 1/600—1/500 lin. crassis, sphsericis,

arctis, virescentibus; peridermate tenui, hyalino; cellulis perdurantibus globosis, ad 1/400 lin. crassis. Pegu, in montibus Yomæ centralis, Whathabwot-choung ad declivia limosa (4138).

*38. NOSTOC LIMOSUM, Z., n. sp.

Terrestre, thallo olivaceo-fusco, tenui, indefinite expanso; filis brevibus rectis, dense implicatis, filis leptothrichoideis tenerrimis, articulatis, hyalinis intermixtis; articulis 1/500—1/300 lin. crassis, auctis, globosis v. ellipticis, arcte connexis, granulis viridibus fartis; peridermate hyalino, achromatico; cellulis perdurantibus sphæricis, duplo majoribus. Pegu, in planitie fluminis Irrawaddi, in limo ripario fluvii Lein inter Theo-choung et Beendau Hseat (3157).

*39. NOSTOC SAVATILE, Z., n. sp.

Subglobosum, votustate intus cavum, magnitudine cerasi, olivaceo-fuscum, aggregatum; peridermate fuscescente, filis non vaginatis, flexuosis; articulis ellipticis, pallide ærugincis, subtiliter granulatis, 1/600—1/500 lin. crassis; cellulis perdurantibus globosis, ad 1/375 lin. crassis. Pegu, in montibus Yomæ centralis, Kayeng-mathay-choung in saxis arenosis humidis (3180).

SPERMOSIREÆ.

*40. Anabæna bullosa, Kg.

Pegu, in valli fluminis Sittang, in laculo prope Otweng, Tounghoo (3150); Pegu, in planitie fluvii Pazwoondoung, Bala-choung in limo (3211/6).

*41. Anabæna flos-aquæ, Kg.

Pegu, in fluvio Lhein inter Beendau-Hseat et Theong-choung (3159).

*42. Anabæna stagnalis, Kg.

Pegu, in fluvio Lhein prope Beendau-Eng (3161/6); Khyoung-gyee ad ripas fluminis Irrawaddi (3164).

*43. Anabæna subtilissima, Kg.

Rangoon, in limo canalium æstuariarum (3205).

*44. ANABÆNA INDICA, Z., n. sp.

Strato tenui, expanso, obscure viridi, deinde fusco; filis rectiusculis, densis, subvaginatis, ærugineis, denique fuscis, apicem versus attenuatis; articulis tenuioribus 1/650 ad 1/600 lin. crassis, sphæricis, sæpe geminatis; crassioribus (sporangiis) ad 1/350 lin. crassis, sphæricis, v. ellipticis; cytioplasmate dilute ærugineo, granuloso. Arracan, Akyab, in limo aquæ subsalsæ (3213, 3218); Pegu, in montibus Yomæ, Yaitho-choung, in arena humida rivuli frequens (3234).

*45. CYLINDROSPERMUM HUMICOLA, Kg.

Pegu, in limo ripario fluminis Irrawaddi ad Khyoung-gyee (3165).

*46. CYLINDROSPERMUM MACROSPORUM, Kg.

Pegu, Kadeng-choung ad Natmadhee, natans (3230).

RIVULARIEÆ.

*47. GLOJOTRICHIA KURZIANA, Z., n. sp.

Thallo globoso, lineam crasso, obscure olivaceo; filis ærugineis, brevibus, subulatis; articulis sæpe confluentibus, inferioribus ad 1/300 lin. crassis, diametro duplo brevioribus, superioribus eam æquantibus; vaginis ad 1/150 lin. crassis, achromaticis, sporis ærugineis v. lutescentibus, ovatis, basi ventricosis, ad 1/180 lin. crassis, diametro 2-4plo longioribus, dense granulatis; cellulis perdurantibus sphæricis, 1/250 lin. crassis.—Arracan, Akyab in plantis aquæ dulcis (3212).

*48. RIVULARIA PEGUANA, Z., n. sp.

Thallo gelatinoso, indefinite expanso, olivaceo, molli, hyalino; filis inclusis ærugineis, basi 1/300 superne 1/500 lin. crassis, apice plus minusve acuminatis, laxe intricatis, flexuosis, nunc distincte articulatis, articulis v. moniliformibus, diametro æqualibus v. duplo longioribus; nunc—præsertim in parte superiore,—continuis; cellulis basilaribus globosis, 1/300—1/175 lin. crassis, denique in sporangia fusca permutatis.—Pegu, Kadeng-choung ad Natmadhee in truncis vetustis submersis (3228).

MASTIGOTHRICHEÆ.

*49. MASTIGOTHEIX ÆRUGINEA, Kg.

Pegu, Yenay Eng, in planitie alluviali fluminis Irrawaddi, ramis emortuis insidens (3132).

*50. Schizosiphon parietinus, Næg.

Arracan, Akyab in parietibus Phari vetusti (3215).

SCYTONEMACEÆ.

*51. SCYTONEMA AUREUM, Menegh.

Pegu, in variis locis frequens, ad rupes et corticola.—Elephant-point (3276); inter Rangoon et San-yæ-wa (3352); in montibus Yomæ centralis, Kayeng-mathay-choung, ad saxa arenosa (3173).

*52. SCYTONEMA CINEREUM, Menegh.

Pegu, in templis pagoda dictis vetustis fere undique; Kya Eng in templo vetusto (3199).

var. b. Julianum, Rabenh. (Drilosiphon Julianue, Kg.). Pegu, in montibus Yomse centralis, Yay-gna-choung ad saxa arenosa (3236).

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Uttarpara Valkrishna Public Librara *53. SCYTONEMA GRACILE, Kg.

Pegu, in planitie fl. Irrawaddi, Palay Kweng in cisternæ muris (3224).

*54. SCYTONEMA TOMENTOSUM, Kg.

Supra Rangoon, corticola (3466).

*55. SCYTONEMA PEGUANUM, Martens.

Pegu, in valle Sittang (3139); Phoung-gyee (3118), in truncis arborum frequens.

*56. SCYTONEMA VARIUM, Kg.

Pegu, in montibus Yomæ, in valle Choung-menah (Khaboung) (3152); Wachoung (Pazwoondoung) (3241/0).

*57. SCYTONEMA VIEILLARDI, Mart.

Arracan, Akyab, in stagnis exsiccatis subsalsis (3287).

*58. SCYTONEMA FULVUM, Z., n. sp.

Strato obscure olivaceo; filis curvatis, 1/180—1/120 lin. cum vagina crassis, fulvis; pseudoramulis sparsis, divaricatis, conformibus; apicibus attenuatis, clausis, extremis hyalinis; filis internis vix conspicuis, pallide virescentibus; articulis obsoletis; vaginis lævibus, arctis, aureo-fulvis.—Pegu, Rangoon in foliis calami (3467); Yoma in cortice arborum (3146).

*59. SCYTONEMA FUSCUM, Z., n. sp.

Strato pannoso, fusco-rubescente; filis 2-3 lin. altis, subsimplicibus, gracilibus, elongatis, basi 1/180—1/120 lin. cum vagina, superne 1/200 lin. cum vagina, 1/300—1/250 lin. sine vagina crassis; vaginis lævibus, saturate fuscis, apicem versus pallidioribus; filis inclusis pallide virescentibus, obsolete articulatis, granulatis, articulis diametro æqualibus.—Pegu, in terra nuda et ad declivia argillosa, Sanyæ-wa prope Rangoon in oryzetis (3201); in montibus Yomæ in valle fluvii Choung-menah (3153); Wachoung, in via cava (3187).

*60. SCYTONEMA KURZIANUM, Z., n. sp.

Strato olivaceo; cæspitulis vix lineam altis, compactis; filis 1/300 lin. cum vagina 1/450 lin. sine vagina crassis, subsimplicibus, basi coalescentibus curvatis, internis articulatis, viridi-lutescentibus; articulis sæpe obsoletis, diametro æqualibus; vaginis achromaticis v. lutescentibus; cellulis perdurantibus globosis.—Pegu, Yoma, in cortice arborum (3141/a).

*61. SCYTONEMA MUBALE, Z., n. sp.

Strato compacto, spongioso, lineam crasso, sordide olivaceo, v. nigrescente; filis intricatis, flexuosis, parce ramosis; pseudoramulis conformibus, brevibus, cum vagina 1/300—1/200 lin. crassis, luteis, apice cinereis, inter-

dum roseolis; filis internis 1/350—1/300 lin. crassis, pallide viridibus, apice hyalinis, distincte articulatis; articulis diametro sequalibus, v. duplo brevioribus; vaginis subachrois, arctis; cellulis perdurantibus globosis.—Rangoon ad muros hospitii circuit-house dicti (3207, 3209).

*62. SCYTONEMA OLIVACEUM, Z., n. sp.

Strato cespitoso, 2-3 lin. alto, olivaceo; filis leviter flexuosis, rigidis, cum vagina 1/150—1/115 lin. crassis; internis 1/180 lin. crassis, cinereis, distincte articulatis; articulis lamellosis, v. granulosis et linea transversali dimidiatis, diametro parum, hine inde 2‡plo brevioribus; pseudoramulis, divaricatis, sæpe geminis, non tenuioribus; vaginis fuscis, lævibus. Pegu, in montibus Yomæ centralis, Zamayee-choung, in fissuris humidis rupium arenosarum (3235).

*63. SCYTONEMA PARVULUM, Z., n. sp.

Strato tenui, tomentoso, fuscescente; filis brevibus, subsimplicibus, attenuatis, basi 1/375 lin. superne 1/500 lin. cum vagina vix 1/700 lin. sine vagina crassis, a basi distincte articulatis; articulis diametro æqualibus, vel longioribus, superne confluentibus; vaginis fuscis, filis internis viridibus. Pegu, in saxis arenosis montium Yomæ australis (3156).

*64. SCYTONEMA (SYMPHYOSIPHON) RHIZOPHORE, Z., n. sp.

Cespitulis obscure olivaceis (in siccatis cinereo-nigrescentibus), spongio-so-hirtis, semilineam crassis; filis fasciculatis, flexuosis, fuscis, parce pseudoramosis, cum vagina 1/300—1/225 lin. crassis, apicem versus attenuatis, internis pallide ærugineis; articulis diametro æqualibus, vel ad triplum brevioribus, sæpe obsoletis; vaginis arctis, basi et apice brevi, acuminato, hyalinis; cellulis perdurantibus oblongis. Pegu, Elephant-point, in rhizophoretis ad cortices arborum diversarum, imprimis Sonneratiæ apetalæ (3267).

*65. SCYTONEMA SUBCLAVATUM, Z., n. sp.

Calcicola; strato obscure olivaceo, filis fuscis, sæpe basi connatis, partim (junioribus?) sursum incrassatis, 1/30—1/20 lin. longis, simplicibus, curvatis, ad 1/180 lin. crassis; partim elongatis, ramello uno alterove instructis, 1/300 lin. cum vagina crassis; filis internis virescentibus, nunc obsolete, nunc distincte articulatis; articulis diametro æqualibus; vaginis arctis. (Forsan status Scytonematis muralis). Pegu, in domo vetusta lateritia oppidi Henzadah (3167, 3168, 3169).

*66. SCYTONEMA VIOLASCENS, Z., n. sp.

Cespite erecto, 3-4 lin. alto, pallide violaceo; filis basi 1/150—1/100 lin. cum vagina 1/130—1/110 lin. sine vagina crassis, fasciculatis, parce ramosis; pseudoramulis interdum binis, adpressis, vel intricatis, elongatis, gracilibus, flagelliformibus, variegatis, violaceis, ærugineis et fusco-luteis, ad 1/250 lin.

attenuatis, apice pallidioribus vel hyalinis; articulis diametro ad duplo brevioribus, sæpe confluentibus; vaginis arctis, hirtis, hyalinis v. lutescentibus. Pegu, Yoma in valle Choungmenah (Khaboung) ad declivia argillosa (3154).

*67. POLYPOTHRIX BINATA, Z., n. sp.

Lacustris, cæspitulis 2-3 lin. altis, ærugineo viridibus; filis pulchre ærugineis, primariis 1/300 lin. crassis, pseudoramulis divaricatis, elongatis, 1/500 lin. crassis; articulis inferioribus distinctis, sæpe dimidiatis, plerumque diametro duplo longioribus, rarius ei æqualibus v. brevioribus, subtorulosis, supremis confluentibus. (Articuli sæpe ad modum Sirosiphonis longitudinaliter bipartiti). Pegu, Kya Eng, in radicibus submersis (3195, 3203) Eng-ga-na (3242, 3248).

SIROSIPHONIACEÆ.

*68. SIROSIPHON PARASITICUS, Z., n. sp.

Strato cespitoso, fusco; filis virescentibus, 1/200 lin. cum vagina 1/300 sine vagina crassis, curvatis, parce ramosis; ramis ascendentibus, homogeneis; articulis sæpe obsoletis, vel confluentibus, duplici serie ordinatis, granulosis, diametro brevioribus; vaginis arctis, luteis v. hyalinis. Pegu, Yoma, Choungmenah, in sylvis sempervirentibus ad folia arborum et fruticum (3292).

PALMELLACEÆ.

*69. PLEUROCOCCUS VULGARIS, Menegh. (*Protococcus*, Kg.). Rangoon, ad parietes hospitii circuit house dicti (3210).

DESMIDIEÆ.*

*70. CLOSTERIUM STRIOLATUM, Ehrenb.

Pegu, Kya Eng, inter plantas submersas aquaticas.

*71. PLEUROTÆNIUM BACULUM, De Bary (*Docidium*, Bréb.). Pegu, in palude prope Wanet, natans (3238/a).

*72. PLEUROTÆNIUM TRABECULA, Næg. (Docidium Ehrenberghii, Bréb.).

Pegu, Eng-ga-na prope Phounggyee (3242).

*78. EUASTRUM ANSATUM, Ralfs.

Pegu, Eng-ga-na (3242).

*74. EUASTRUM AMPULLACEUM, Ralfs.

Pegu, Kya Eng.

* These are only stray Desmids found by DD. Zeller and Rabenhorst amongst the Algæ. My collection of Burmese Desmids is in the hands of Mr. W. Archer of Dublin. (S. Kuzz.)

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ZYGNEMACEÆ.

*74. RHYNCHONEMA KURZII, Z., n. sp.

Articulis sterilibus fine replicatis, diametro (1/120—1/100 lin.) 6-8plo longioribus, sporiferis tumidis; sporis fuscis, ellipticis, diametro (1/40 lin.) 2-2\frac{1}{2}plo longioribus; fasciis spiralibus 2 laxis, torulosis, anfractibus 2. Pegu, Eng-ga-na (3242).

*75. SPIROGYRA ADNATA, Kg.

Pegu, Pazwoondoung, Balachoung (3247).

*76. Spirogyra crassa, Kg.

In lacu prope Rangoon (3251).

*77. SPIROGYRA DECIMINA, Kg.

Prome, Toung-naweng-choung (3155); Myoma, in rupibus fluminis Irrawaddi (3170); Pegu, Kenbatee in fonte scaturiente (3165/a); Pazwoondoung-choung ad Kyauzoo (3184). Alga vulgatissima Burmæ, præsertim in planitiebus alluvialibus.

Forma crassior, filis sterilibus ad 1/38 lin. crassis. Pegu, in montibus Yomse centralis, Wathabwot-choung, in fluvio frequens (3174).

*78. SPIROGYRA TRREGULARIS, Næg.

Pegu, Yomah centralis, Wopyoo-choung (Khayengmathay-chg.) versus Ghalee Tay natans (3177); Rangoon in canalibus æstuariis subsalsis (3204).

*79. Spirogyra jugalis, Kg.

Pegu, Kya Eng (3198).

*80. SPIROGYRA LONGATA, Kg.

Prome, Khyee Thay in flumine Irrawaddi (3137); Arracan, Akyab (3211).

*81. Spirogyba majuscula, Kg.

Pegu, in palude quadam prope Thounggyee (3244).

*82. Spirogyra nitida, Kg.

Pegu, in palude inter Theanchoung et Oakkan (3161/a); Prome, Khyeethay in flumine Irrawaddi (3137); Arracan, Akyab, in aqua dulci (3219).

*83. SPIROGYRA QUININA, Kg.

Arracan, Akyab in aqua subsalsa (3289).

var. β. inæqualis, Næg. Pegu, Beeling Kadeng-choung ad Kway makheing (3232).

*84. SPIROGYRA TROPICA, Kg.

Arracan, Akyab, in aqua subsalsa (3289).

*85. ZYGNEMA STELLINUM, Ag.

Pegu, Tonkyan in vicinitate rivuli Bala-choung (3289).

*86. ZYGNEMA VAUCHERH, Ag. Pegu, Kya Eng (3194).

*87. ZYGNEMA AMPLUM, Z., n. sp.

Viride, siccatum obscure fuscum; articulis sterilibus diametro (1/60 lin.) ante divisionem 2-3plo longioribus, post eam æqualibus, v. sesquilongioribus; fructiferis non tumidis, zygosporis globosis, v. late ellipticis; filis in vagina 1/40 lin. crassa, tonui, continua, subtiliter granulosa, hyalina, inclusis. Pegu, in laculo inter Phounggyee et Kyauzoo (3246).

*88. MESOCARPUS INTRICATUS, Hass.

Pegu, in palude inter Tean-choung et Oakkan (3161).

*89. MESOCARPUS SCALARIS, Hass.

Pegu, Eng-ga-na (3242); Yoma australis, infra pagum Karensium Mui-hau dictum in rivulo (3256).

*90. STAUROSPERMUM FRAGILE, Z., n. sp.

Filis luteolis, intricatis, fragilibus; cellulis diametro (1/140—1/100 lin.) 5-10plo longioribus, ad genicula contractis; zygosporis quadrangularibus, 1/100—1/80 lin. crassis; sporodermate lævi. Pegu, Rangoon in lacu (3252); Kadeng-choung ad Natmadhee (3223). In provincia Pegu, præcipue secus fl. Irrawaddi, vulgaris.

VAUCHERIACEÆ.

*91. VAUCHERIA SESSILIS, DC., a. cespitosa, Ag.

Pegu, Yoma centralis, Khayeng-mathay-choung (3172); var. b. repens, Hass. (forma terrestris); ibidem, in limo siccescente (3181).

ULVACEÆ.

92. ENTEROMORPHA COMPRESSA, L., var. c. complanata (E. complanata, Kg.).

Pegu, Elephant-point in rhizophoretis (3278); Arracan, Akyab, in mari (3281, 3284).

*93. PHYCOSERIS BURMANICA, Z., n. sp.

Viridis, in sicco seepius pallide olivacea, radice minuta, disciformi; stipite tenerrimo, rotundato, brevi, mox in phycoma planum, rigidum, basi oblique cuneatum atque attenuatum, obovatum, rectum v. curvatum, 1-2 pollicare, margine in adultioribus crenulatum, transiente. Cellularum diameter 1/800 lin. Pegu, Elephant-point, in rhizophoretis ad radices.

DIPLOSTROMIEÆ

*94. DIPLOSTROMIUM TENUISSIMUM, Kg

Pegu, Elephant-point, in rhizophoretis ad radices (3272).

CONFERVACE Æ

*95 CONFERVA FUNKII, Kg

Pegu, in palude prope Phounggyee (3244)

*96 CONFERVA RHYPOPHILA, Kg

Pegu, in planitie fluminis Irrawaddi, Eng suay in tiuncis submersis. (3165/c)

*97 CONFERVA SUBSFTACEA, Kg

Anacan, Akyab in aqua subsalsa (3288)

*98 CONFERNA BURMANICA, Z, n sp

Albo viiescens, iigida, intricata, articulis dirinctio (1/130 1/100 lm) 21 5 plo longioribus Pegu, Yenry eng in planitie fi Irrawaddi, in plantis ujurticis (3105/6)

*99 CONFFRVA UIRICUIOSA, Kg

Pegu, Yoma centi dis, Khayeng mathay-choung, in stagnis natans (3171), Iay Iay-choung (Zamayee) in limo sicce-cente (3179)

- *100. Conffrva in Equatis, Rabenh (Psichohormium, Kg), forma, filis ad 1/120 lin ciassis Rangoon in aqua vadosa lacus natans (3243)
 - *101 RHIZOCLONIUM HOOKERI, Kg Pegu, Elephant point in limo marino (3260)
 - *102 RHIZOCIONIUM ARBORLUM, Z, n sp

Obscure viride, siccatum cinerascens, filis a basi apicem versus paulo attenuatis, hine inde ad genicula intumescentibus, bievissime radicantibus et genuflexis, articulis diametro (1/35—1/25 hn) æqualibus, vel duplo longioribus, cytiodermate crasso Pegu, Elephant point, in rhizophoretis ad corticem arborum (Sonneratia apetala) frequentissime truncorum latus ad septentrionem vergens dense investiens (3261)

- 103 CLADOPHORA CALLICOMA, Kg (Cl glomerata, forma III. Rabenh) Pegu, Kadeng-choung ad Natmadhee (3225)
 - *104 CLADOPHOBA JAVANICA, Kg Ibidem (8226)
- *105 CLADOPHORA STREFENS, Kg (Cl. fracta c strepens, Kg). Pegu, Yoma centralis, Wopyoo, choung (Khayeng-mathay-chg) versus Ghalee Tay (3177)

106. CLADOPHORA TRANQUEBARIENSIS, Kg.

Pegu, Yoma centralis, Tay Tay-choung, natans (3183).

*107. CLADOPHORA CODIOLA, Z., n. sp.

Cespitosa, viridis, sicca pallida, pygmæa, vix 2 lin. longa, subsimplex; filis 1/100—1/75 crassis, apice incrassatis, obtusis; ramellis raris, uni-articulatis; articulis diametro 8-20 plo et ultra longioribus, infimo perlongo; cytiodermate crasso, hyalino, lævi; cytioplasmate granulari. Pegu, Irrawaddi, Eng-suay in truncis submersis (3166).

108. CLADOPHORA EXIGUA, Z., n. sp.

Sordide viridis, cespite 1-2 lin. alto; filis inferne ramosis, rigidis; ramis paucis, divaricatis, elongatis; articulis primariis 1/100 ad 1/90 lin., mediis 1/160 lin., ramorum 1/350—1/250 lin. crassis, diametro 2-3plo longioribus, ad genicula constrictis; cytiodermate crassiusculo. Pegu, Balachoung, in conchis (*Paludina*.) (3197).

*109. CLADOPHORA (ÆGAGROPILA) CONTORTA, Z., n. sp.

Cespitosa, pallide viridis, filis e radice pulposa provenientibus, simplicibus, perraro ramellum uniarticulatum emittentibus, 2-4 poll. longis, in funiculos contortis, basi 1/80 lin., sursum ad 1/35 lin. apice 1/100 lin. crassis; articulis cylindricis, valde inæqualibus, diametro 2-12 plo longioribus. Pegu Tonghoo, in fundo naviculi in fluvio Sittang (3143).

110. CLADOPHORA MINUTISSIMA, Z. (ad interim).

Pallide viridis, filis in cortice truncorum radicantibus, dense aggregatis, semilineam vix superantibus, 1/250—1/150 lin. crassis, simplicibus, v. raro ramello unicellulari instructis, a basi apicem versus incrassatis; articulis diametro 1½-3plo longioribus; cytiodermate flaccido, hyalino, cytioplasmate lamelloso. (Forsan Cladophoræ cujusdam status juvenilis). Marina Elephant-point in truncis submersis (3264).

ŒDOGONIACEÆ.

*111. ŒDOGONIUM APOPHYSATUM, A. Br.

Pegu, Kya Eng (3195).

*112. ŒDOGONIUM BRAUNII, Kg.

Pegu, Eng-suay non procul a flumine Irrawaddi infra Henzadah (3166/a); Kadeng-choung ad Natmadhee (3229).

*113. ŒDOGONIUM GRACILE, Kg.

Pegu, Eng-suay in truncis submersis (3165/d).

*114. ŒDOGONIUM LANDSBOROUGHII, Kg.

Pegu, prope Tonkyan supra Rangoon (3248).

*115. ŒDOGONIUM ROTHII, Bréb.

In lacu Rangoonensi fluitans (8258).

*116. ŒDOGONIUM SCUTATUM, Kġ.

Pegu, Kya Eng in radicibus (3195).

*117. ŒDOGONIUM TENELLUM, Kg.

Pegu, in stagnis et fossis prope Tonkyan, vicum supra Rangoon (3248).

*118. ŒDOGONIUM YESICATUM, Link.

Pegu, Eng-ga-na (3242); Yoma centralis, Zamayee-choung in saxis arenosis (3233).

var. g. fuscescens, Kg.

Pegu, Kya-eng in radicibus (3193).

*119. ŒDOGONIUM KURZII, Z., n. sp.

Monœcum; cellula basilari biloba, articulo terminali obtuso, articulis diametro (1/45—1/32 lin.) 2-5 plo longioribus, sæpe medio dilatatis, v. cuneiformibus, passim uno fine transversim plicatis; oogoniis sparsis, raro seriatis, ellipticis, diametro (1/30 lin.) 1½-2 plo longioribus; oosporis fuscis, sphæricis, v. diametro paulum longioribus; antheridiis unicellularibus, lanceolatis, medio constrictis. Pegu, in palude prope Wanet (3255).

*120. Bulbochæte intermedia, De Bary.

Pegu, Kya Eng (3195, 3203).

*121. BULBOCHÆTE PEGUANA, Z., n. sp.

Dense intricata, repetite ramosissima, ramis alternis vel oppositis, sensim attenuatis et setis longis, vix 1/1500 lin. crassis, terminatis; articulis fili primarii ad 1/200 lin. crassi 2-3 plo, ramorum 1/300—1/500 lin. crassorum 5 plo et ultra longioribus; oosporis ignotis. Pegu, Yoma centralis, ad rupes calcareo-siliceas inter muscos in cacumine montis Kambala-toung, alt. 3200 ped. s. m. (3459).

ULOTHRICHACEÆ.

*122. Ulothrix subtilis, Kg.

Pegu, Eng-ga-na (3242).

*123. Schizogonium tenuissimum, Z., n. sp.

Pallide flavo-virens, filis simplicibus 1/500—1/375 lin. crassis, passim ramellosis; cellulis diametro duplo longioribus, gonidiis oblongis. Martabania, in Chinchonse plantationibus, 3500 ped. altitudinis, in rivulo Opochoung, Shantounggyee (3142).

CHROOLEPIDEÆ.

*124. CHROOLEPUS FLAVUM, Kg.

Yoma centralis, ad bambusarum culmos (3144).

var. filis tenuioribus, articulis longioribus, *Chr. flavi* et *elongati* intermedium. Yoma, ad arborum corticem frequens (3145).

*125. CHROOLEPUS LAGENIFERUM, Hildebrand.

In lacu Rangoonensi, inter Confervam inæqualem in aqua vadosa natans (3243).

*126. Chroolepus umbrinum, Kg. (Protococcus crustaceus, Kg.). Pegu, Yoma, Yaitho-choung, corticola, frequens (3148).

• *127. CHROOLEPUS BOTRYOIDES, Z., n. sp.

Cespite siccitate pallide luteo, villoso, 2-3 lin. alto; filis flaccidis, ad 1/100 lin. crassis, lævibus; ramis subsecundis, divaricatis, attenuatis, apice 1/250 lin. crassis; articulis diametro $1\frac{1}{3}$ -2 plo longioribus; spermatiis globosis, minutis, plerumque ad latera ramorum in cumulos botryomorphos aggregatis. Pegu, Yoma, in cortice arborum (3147).

128. CHROOLEPUS CALAMICOLA, Z., n. sp.

Cespite intricato, viridi, (in sicco pallide lutescente); filis ramosis, ramis attenuatis, subsecundis, divaricatis; articulis infimis 1/120 lin. crassis, diametro sesquilongioribus; superioribus diametro (1/300 ad 1/180 lin.) 2-4plo longioribus; spermatiis plerumque lateralibus, raro terminalibus, sessilibus, globosis v. ellipticis, 1/180 lin. crassis, solitariis, v. seriatis. Supra Rangoon, in silvis sempervirentibus in foliis Calami (3467).

*129. CHROOLEPUS ELONGATUM, Z., n. sp.

Cespitosum, siccitate flavo-cinereum, filis rectis, rigidis, 1/150 lm. crassis, ramosis; ramis secundis, valde elongatis, acuminatis, 1/300—1/225 lin. crassis; articulis primariis diametro duplo, ramorum 4-6 plo longioribus; spermatiis ignotis. Pegu, Yoma, Yaitho-choung, in cortice arborum in sylvis sempervirentibus (3148).

*130. CHROOLEPUS FUSCO-ATRUM, Z., n. sp.

Strato tenui, crustaceo, fusco-atro (in sicco); filis brevibus, rectis, v. parum curvatis, torulosis; ramis divaricatis; articulis fuscis, 1/400—1/300 lin. crassis, globosis, v. late ellipticis. Pegu, in valle Choungmenah (Khaboung) non procul a Tonghoo, in sylvis sempervirentibus (3469).

*131. Chroolepus Kurzii, Z., n. sp.

Semipollicare, viride, cespitosum, in fasciculos conicos dense implicatum, filis primariis ad 1/125 lin., ramorum ad 1/300 lin. crassis; articulis diametro 2-4plo (rarius pluries) longioribus; ramis divaricatis, subsecundis; spermatiis lateralibus, creberrimis, seriatis, sessilibus v. breviter petiolatis, initio globosis, deinde crateriformibus, 1/250—1/60 lin. crassis. Pegu, Tonghoo, Choungmenah-choung in sylvis sempervirentibus ad folia fruticum (præcipue Alsodeiæ) (3149).

*132. Chroolepus tenue, Z., n. sp.

Cespitulis exiguis, gregariis, aurantiacis, siccatis cinereis; filis primariis 1/375—1/300 lin. crassis, varie flexuosis; ramis divaricatis, interdum recurvis, 1/500—1/400 lin. crassis; articulis diametro æqualibus, vel ad duplum longioribus, torulosis; spermatiis globosis, terminalibus et lateralibus. *Ohr. abietino* proximum, sed articulis omnibus plus minus inflatis, brevioribus et tenuioribus distinguendum. Pegu, Elephant-point, in rhizophoretis ad corticem *Sonneratiæ apetalæ* frequens (3268).

CHÆTOPHORACEÆ.

*133. STIGEOCLONIUM TENUE, H., γ . gracile, Kg. Pegu, Beendau Eng in caulibus Polygoni (3141).

*134. STIGEOCLONIUM RANGOONICUM Z., n. sp.

Cespite vix 1½ lin. alto. dilute viridi, vel lutescente, dense implicato; filis primariis 1/375—1/250 lin. crassis; ramis subdichotome secundis, ad 1/900 lin. crassitiem attenuatis, flaccidis; articulis valde inequalibus, diametrum æquantibus torulosis, ad genicula leviter constrictis, vel cylindricis et ea 2-6plo longioribus. In cisterna quadam oppidi Rangoon (3249).

*135. CHÆTOPHORA PISTFORMIS, Ag.

Pegu, Phounggyee in laculo ad radices submersas (3190); Prome. Myitmakha-choung ad Gho-tau, in plantis aquaticis (3140).

*136. CHATOPHORA BADIANS, Kg. Pegu, Kya Eng in radicibus (3193).

*137. Cuetophora tuberculosa, Kg.

Pegu, in laculo inter Phounggyee et Kyauzoo (3245).

*138. CHÆTOPHORA STRICTA, Z., n. sp.

Viridis, expansa, mollis, 1-2 lin. crassa; filis internis repetite et dichotome ramosis, strictis; ramis attenuatis, gracilibus, non piliferis; articulis oblongis, ad 1/350 lin. crassis, diametro 1½-3plo longioribus. Pegu, Kadeng-choung at Natmadhee in ramis emortuis submersis (3231); Prome, Khyee-thay, ad silices rivuli tenui aqua fluentis in flumine Irrawaddi (3136).

*139. GONGROSIRA PYGMÆA, Kg.

Forma tenuis, non ultra 1/180 lin. crassa. Rangoon, ad rudera lateritia submersa (3250).

140. Gongrosira onusta, Z., n. sp.

Flavo-viridis, cespitibus confluentibus, lineam crassis; filis e basi fibrosa continua articulatis; articulis diametro (1/150—1/100 lih.) 2—8plo longioribus; ramis numerosis, undique egredientibus, moniliformibus; articulis

ramorum omnibus oogonia globosa, ad 1/125 lin. crassa, formantibus; oosporis fuscis, 1/250 lin. crassis. Pegu, Elephant-point secus littora in truncis vetustis inundatis (3262).

CHANTRANSIEÆ.

*141. CHANTRANSIA BOSEOLA, Z., n. sp.

Cespitulis minutis, roseo-chalybeis; filis 1/400—1/300 lin. crassis, fastigiatim ramosis; ramis distantibus, erectis; articulis diametro 4plo longioribus. Pegu, Beendau Eng, in caulibus Polygoni (3141).

BATRACHOSPERMACEÆ.

142. BATRACHOSPERMUM MONILIFORME, Roth.

Pegu, in gurgite profundo paludis prope Phoungyee, ad radices arborum (3188).

HILDENBRANDTIACEÆ.

*143. HILDENBRANDTIA ARRACANA, Z., n. sp.

Incrustans, indeterminata, vage expansa, arctissime adnata, fusco-purpurea; cellulis 1/700—1/600 lin. crassis, obsolete angulosis, rotundatis, absque ordine coacervâtis. Arracan, Akyab in rupibus maritimis frequens, (3282).

CERAMIEÆ.

*144. GONGROCERAS RADICANS, Z., n. sp.

Capillare, repens, pollicare, apicibus rectis, vel parum curvatis, non forcipatis; filis intricatis, subpectinatis, vel repetite dichotomis, radicantibus; radiculis numerosis e parti inferiori egredientibus, continuis, vel articulatis; articulis cylindricis, diametro nunc 1½-2plo longioribus, nunc ei æqualibus, supremis brevioribus; zonis superioribus confluentibus; tetrachocarpiis plerumque infra apices ramorum verticillatim dispositis. Pegu, Elephant-point in rhizophoretis ad radices truncosque arborum inundatos, (8274).

HALYMENIEÆ.

*145. CATENELLA OPUNTIA, Grev.

Pegu, Elephant-point, frequens in rhizophoretis et secus littora in truncis vetustis inundatis, (8265).

GELIDIEÆ.

146. ACROCARPUS INTRICATUS, Kg. (Gelidium, Kg., Sphærococcus, Ag.).

Arracan, Akyab in rupibus marinis, (8279).

POLYSIPHONIEÆ.

*147. POLYSIPHONIA SUBADUNCA, Kg., major, ramis crebrioribus, minus strictis.

Pegu, Elephant-point, in rhizophoretis frequens, (3274).

*148. BOSTRYCHIA INTRICATA, Mont.

Pegu, Elephant-point, in rhizophoretis frequens, (3263).

*149. BOSTRYCHIA RIVULARIS, Harv.

Pegu, Elephant-point, in rhizophoretis ad arborum radices, (3271).

DELESSERIEÆ.

*150. Hypoglossum Bengalense, Mart.

Pegu, Elephant-point, in truncis vetustis inundatis ad littora satisfrequens, (3266).

*151. HYPOGLOSSUM LEPRIEURII, Kg.

Pegu, Elephant-point, in rhizophoretis frequens, (3270).

APPENDIX.

CHARACEM BURMANICE,* determined by Dr. A. Braun, Professor of Botany in Berlin.

1. NITELLA ROXBURGHII, A. Br.

Pegu, Kya Eng, (3295).

2. NITELLA MICROGLOCHIN, A. Br sp. v. subsp. nov. N. oligospiræ proxima.

Arracan, in valle Koladyne in stagno quodam silvatico.

3. N. OLIGOSPIRA, A. Br.

Pegu, Kya Eng, (3294).

4. Chara gymnopitys, A. Br.

Arracan, frequentissima in oryzetis inundatis vallis Kolodyne, (1964).

• It may not, I think, be uninteresting to insert at this opportunity the few. Characea, which have as yet been found in Burma. I am indebted to Prof. A. Braun who obligingly sent me the list a long time ago, for the names of the species. (S. Kuez.)

194 [No. 3,

ON THE PTEROPIDE OF INDIA AND ITS ISLANDS, WITH DESCRIPTIONS OF NEW OR LITTLE KNOWN SPECIES,—by G. E. Dobson, B. A., M. B., Staff Surgeon, H. M.'s British Forces.

(With Plate XIV.)

[Read July 5th, received July 18th, 1873.]

Although Dr. W. Peters has done so much towards clearing up the synonymy of the *Pteropidæ* as well as of other families of Chiroptera, much yet remains to be done before a correct list of the species can be obtained.

The state of confusion into which the species of this family have fallen, in common with most species of Chiroptera, is mainly due to the great imperfection of the original descriptions, from many of which it is impossible to recognise the family to which the species belongs.* This imperfection in description has arisen chiefly from the general ignorance respecting the Order which has prevailed amongst Zoologists, who seem to have shared the vulgar antipathy to these animals, if we may judge from the small amount of attention they have received, and also from the want of proper material in the Museums. Most of the *Pteropidæ* being large bats, and therefore unlikely to be preserved by collectors in spirit, have been described from dried specimens, and this also has added much to the imperfection of the description.

Much work, therefore, remains to be done both in obtaining well-preserved duplicates, in comparing them with the type specimens, and in producing from them descriptions from which it may be possible for naturalists in general to determine the species.

If the species of the genus *Pteropus*, as given by Drs. Peters and Gray,† be enumerated, there will be found to be not less than fifty.

FIN 1' 4 '1 4'	•
The distribution of these fifty species is as follows:—	•
Continent of India and Burma,	1
Malay Archipelago,	25
China, Japan, and Loo-choo Islands,	
Solomon Islands; New Caledonia; New Hebrides; Fiji	
Islands; Marianne and Viti Islands,	9
Australia,	5
Africa and its Islands,	6

^{*} Thus Dr. J. E. Gray remarks (P. Z. S. Lond., 1866, p. 148)—"The generic characters of Asllo, as given by Dr. Leach, occupy nearly a page of a quarto book, and yet no one has been able to discover the genus. One could not have a more convincing proof that it is not mere length of character that is required to define a genus."

[†] See Peters in Monatsb. Berlin Akad., 1867, p. 323, and Gray's Catalogue of Monkeys, Lemurs and Fruit-eating Bats, 1870.

It is very remarkable that, supposing the localities to be correct or approximately so, one half of the whole number of species is distributed among the small islands of the Malay Archipelago, while a single species—

Pteropus medius—is the sole representative, hitherto discovered, of the genus in the Continent of India and Burma.

That a large proportion of the species should be found in the Malay Archipelago and adjoining Islands might be expected, as these animals like monkeys can live only where a constant supply of fruit is attainable throughout the whole year, but the same conditions obtain in the greater part of the Peninsula of India, and especially in Equatorial Africa, yet scarcely one-seventh of the whole number has been found in these regions.

The Malay Archipelago is, therefore, either the original and special home of the genus from which a few species have wandered into India and Africa, or many species remain undiscovered in the latter countries, and probably many of the so-called species which go to make up the large number from Malayana have been founded on insufficient grounds.

I have not the least doubt that the real number of species is much less than that recorded, and that many described as new by Temminck and others will, with the accession of additional and more perfectly preserved specimens to the collections hitherto available in our Museums, be found referable to a few really distinct species. This may be especially expected in the case of those species that have been founded on differences in the colour of the fur, which appears to have been regarded by some zoologists as of equal importance with the colour of the feathers in birds.

I have elsewhere* dwelt at some length on the variability of the colour of the fur in many species of bats, and have shown that, in the *Pteropi* especially, individuals belonging to the same species present very different shades of colour according to sex age and season, and probably also, but in a less degree, according to locality.

Differences in the form of the skull and in the teeth have been also used to distinguish the species, but these, though of the greatest importance, are not satisfactory, if alone available as a means of diagnosis, for it should, surely, be possible to distinguish the species of a given vertebrate animal without first finding it necessary to kill and make a skeleton of it.

It is, therefore, desirable that, in the description of species, certain external characters may be given from which the living animal can be known, and these, I believe, may be found in the shape and relative size of the ears, and in the quality and distribution of the fur.

In all the Chiroptera, we find one or more of the organs of special sense greatly developed to supplement or, in some genera, almost wholly replace the visual organs (which in most cases are very rudimentary or, where

^{*} Proc. Zool. Soc. of London, 1873.

moderately developed, can be of little use owing to the nocturnal habits of the animals), and this development varies remarkably according to family, genus, and species.

Thus the peculiar form of the nose-leaf taken with the shape of the ears at once characterises the *Rhinolophida*, and each species of the family may be distinguished by secondary modifications of these organs alone.

And in those families of bats where the nostrils are not furnished with appendages, the form and relative size of the ear will generally be found to be the most important characters for readily and accurately determining the species, and, next to and with these, the quality and distribution of the fur.

I shall employ this principle of diagnosis in the following descriptions of the species of Frugivorous Bats known to inhabit Continental India and Burma, and the Islands of the Bay of Bengal.

Genus I.—PTEROPUS, Brisson.

Nostrils projecting; upper lip with a vertical groove in front bounded laterally by naked prominences; index finger with a distinct claw, metacarpal bone of second finger shorter than the index finger; wings from the sides of the hairy back; wing-membrane attached to the back of the first phalanx of the second toe; tail none.

Dentition:—in.
$$\frac{4}{4}$$
; c. $\frac{1-1}{1-1}$; pm. $\frac{2-2}{3-3}$; m. $\frac{3-3}{3-3}$.

A.—Ears acutely pointed.

PTEROPUS MEDIUS. Pl. XIV, Fig. 1.

Pteropus medius, Temminck, Monog. Mammal., I, p. 176.

- , edwardsii, (in part) Geoff., Ann. du Mus., vol. xv., p. 92.
- , leucocephalus, Hodgson, Journ. As. Soc. Beng, iv., p. 699.
- " assamensis, McClelland, Proc Zool. Soc. Lond., vii., p 148.

Ears long, with acutely pointed tips, the upper third of the outer margin concave beneath the tip; in fully grown individuals the longest diameter of the opening of the external ear, from the point of junction of the outer and inner margins below to the tip, measures one inch and a half.*

Nostrils projecting, with a deep intervening emargination; upper lip with a narrow vertical groove in front bounded laterally by naked rounded prominences continuous with the integument of the nostrils.

The length of the ear (anteriorly) as given in the tables of measurements accompanying this paper (and also wherever mentioned in previous papers) has been determined by measuring the distance between the termination of the outer margin below and the tip. The breadth has been ascertained by means of a string passed round the ear posteriorly from the inner to the outer margin.

The ears are naked except at the bases posteriorly, and a narrow triangular portion covered with short hairs terminating towards the middle of the outer margin; anteriorly, the anterior flattened edge of the inner side of the conch is covered from the base upwards for about one-third of the length of the ear.

The face is naked in front of a line joining the inner angles of the eyes, and on either side of the naked space (which corresponds to the position of the nasal bones) a few long fine hairs arise from separate papillæ. The fur is rather dense and moderately long on the back of the head, neck, and shoulders, but short and appressed on the back, narrowing to about two inches in width across the loins. A narrow line of short fur passes outwards on to the wing membrane posterior to the humerus for rather more than half its length; the elbow is quite naked, but a few short hairs cover a narrow portion of the wing-membrane, about one inch and a half long, posterior to the forearm. The femur, and the interfemoral membrane as far as a line corresponding to the position of the semi-circular band on the under surface of the membrane are covered; the tibiæ are naked, or have only a few very short hairs; the feet are quite devoid of hair.

On the under surface, the whole body is well covered; the antebrachial membrane is similarly covered as far as a line drawn from the knee to a point about one inch posterior to the elbow joint, thence the hair passes outwards on the wing-membrane posterior to the forearm, terminating at about the beginning of the distal third of the radius. The thighs are covered, the legs and inter-femoral membrane are quite naked.

The nape of the neck and the shoulders are usually reddish yellow or golden yellow or pale straw colour, but every shade of these colours has been observed, the different colours and intermediate shades appearing to depend on sex, age, season, or locality. The darker shades are usually found in females.

The chest and upper part of the abdomen are either of the same colour as the nape of the neck or of a darker hue. The remainder of the fur black or dark brown often mixed with grayish hairs.

The fur of the neck is coarser and longer than that covering other parts of the body. In most male specimens a circular tuft of rigid unctuous hairs, of a deep reddish yellow colour, is found on each side of the neck, situated midway between the base of the ear and the origin of the ante-humeral portion of the wing-membrane from the shoulder. In a large male obtained near Calcutta, these tufts occupy a space one inch in diameter, and the hairs composing them measure about one-third of an inch in length.

Hab.—India generally, from Kachh to Burma, and from the Himalays to Ceylon.

To this section of the genus belongs Pt. edulis, Péron et Lesueur, from

Java and Sumatra, which has been reported from Tenasserim,* and may probably be found in the Nicobar Islands. This species, the largest of known bats, may be readily distinguished from Pt. medius by its ears, and by the distribution and quality of the fur. The ears are proportionately shorter and narrower than in the Indian species, and the concavity of the upper third of the outer margin is much less distinct. In a specimen from Java, in the Indian Museum, the ears are about the same length as in the most adult specimen of Pt. medius, while its forearm exceeds that of the latter species by more than two inches, and the tibia by an inch and a half. Compared with Pt. medius the light coloured portion of the fur extends further down upon the shoulders, and the breadth across the loins occupied by hair is proportionately much greater: this is well seen when specimens of equal size are compared, the breadth of the fur in this position in the not fully grown Pt. edulis being nearly, if not quite, double that in the adult Pt. medius. Elsewhere the distribution of the fur is similar in both species, but the hair on the wing-membranes and legs is conspicuously much longer in Pt. edulis.

B.—Ears rounded at the tip.

PTEROPUS NICOBARICUS. Pl. XIV, Fig. 2.

Pteropus nicobaricus, Fitzingor, Sitzungsb Wien. Akad., 1860, p. 389, nomen nu-

- ", melanotus, Blyth, Cat. Mammal. Mus. As. Soc Beng., 1863, p. 20, nom. «
 nudum.
- " nicobaricus, Zelebor, Reise der Oester. Freg. · Novara,' Saugethiere, 1868, p. 11.

Ears rounded off at the tip, their breadth nearly equal to their length; the upper third of the outer margin slightly flattened, not concave, the lower two-thirds convex; in fully grown individuals the longest diameter of the opening of the external ear, from the point of junction of the outer and inner margins below to the tip, scarcely exceeds one inch.

The distribution of the fur of the body is similar to that of *Pt. medius*, but the hair on the wing-membrane is very much shorter.

In some male specimens the colour of the fur also corresponds very closely with that of *Pt. medius*; generally, however, the lighter coloured portions of fur on the nape of the neck, and on the shoulders and chest, are of a deeper hue than in the latter species, usually dark ferruginous red or chestnut; females and young males are commonly *intensely black throughout*; in some female specimens the position of the light-coloured tippet in the male is indicated by a reddish tinge.

• A very badly preserved dried skin of an immature specimen of some species of *Pteropus*, in the Indian Museum, has been identified by Mr. Blyth with *Pt. edulis*, and the locality 'Tenasserim' recorded in his Catalogue. The specimen is in such a very had condition I am able neither to confirm nor to correct Mr. Blyth's identification.

The skull differs from that of *Pt. medius* in being shorter, wider across the maxillary and nasal bones, and in having nearly all its processes and ridges much more strongly defined. The distance between the small anterior upper premolars exceeds that in *Pt. medius* by one-tenth of an inch. The *foramen ovale* is divided in the centre by a process of bone, in *Pt. medius* it is undivided. A post-orbital process of the zygomatic arch is present, though not so well developed as in *Pt. medius*.

The mandible is shorter and its rami deeper than in *Pt. medius*; the coronoid process is more developed vertically, its posterior margin is nearly straight, not deeply concave, and its superior angle is narrowly, not broadly rounded off as in the latter species.

The teeth are stouter in Pt. nicobaricus but their general characters are the same in both species.*

Hab.—Andaman and Nicobar Islands, probably Java also. An old dried specimen in the Indian Museum is labelled Java, but not numbered in Blyth's Catalogue.

Neither Fitzinger nor Blyth described this species, though they invented names for it. Zelebor's description occupies nearly two pages of a quarto book, and very careful measurements of the original specimen are given, yet, as his description is taken from a young individual and contains few really diagnostic characters, I was unable to feel certain that specimens obtained by me last year from the Andamans and Nicobars should be referred to this species. But Dr. Peters has lately, at my request, very kindly compared some specimens sent to him from the Indian Museum with the type specimens of Pt. nicobaricus in the Vienna Museum. He informs me that they agree in the form of the ear and feet. With this additional information I feel no hesitation in referring the specimen from which the above description is taken, to that species.

Pteropus medius. Pteropus nicobaricus. Pt. edulis.

Longth, head and body, bead, ar (anteriorly), Breadth, ear, Length, from ear to tip of nostril, from eye to tip of nostril, thumb, second finger, fourth finger, tibis, bot and diaws,	1.5 1.4 0.85 2.7 1.3 6.6 2.7 12.5 8.5 8.5 8.0	15 2.75 3.0 10 1.45 1.5 0.8 0.8 2.4 2.6 1.1 1.1 6.0 6.2 2.8 2.8 [11.5 11.8 7.8 8.0 8.7 2.8 2.9 2.0	1.45 1.06 0.8 0.8 2.8 2.65 1.2 1.15 6.3 6.5 5.5 2.8 11.9 12.5 8.0 8.5 2.8 3.0 2.0 2.0	3.0 1.04 0.8 9.45 1.15 5.8 2.5 11.0 7.4 2.8 1.7	5.9 5.8 2.6 2.6 0.5 11.5 7.8 7.8 2.7 2.6 2.0 2.0	1.05 1.2 5.4 8.5 2.35 3.0 11.5 16.0 8.0 10.5 2.6 4.8 2.0 2.4
foot and claws,	2.3			1.7		

* For the dentition of the genus Pteropus see De Blainville, Ostéographie.

Genus II.—CYNOPTERUS.* F. Cuvier.

Nostrils projecting; upper lip with a vertical groove in front, bounded laterally by naked prominences; index finger with a distinct claw; metacarpal bone of second finger exceeding slightly in length the index finger; wings from the sides of the hairy back, wing-membrane attached to the base of the first toe; tail short, distinct.

Dentition: in.
$$\frac{4}{4}$$
; c. $\frac{1-1}{1-1}$; pm. $\frac{2-2}{3-3}$; m. $\frac{2-2}{2-2}$.

CYNOPTERUS MARGINATUS. Pl. XIV, Fig. 4.

Pteropus marginatus, Geoffroy, Ann. du Mus. xiv, p. 97.

" pyrivorus, Hodgson, Proc. Zool. Soc. Lond., 9836, p. 36.

Cynopterus affinis, Gray, Cat. Mammal., 1850, xix, p. 38.

Eleutherura marginata, Gray, Catalogue of Monkeys, Lemurs and Fruit-eating Bats, 1870, p. 118.†

Ears large, rounded at the tip, with a slight but distinct concavity of the outer margin immediately beneath the tip; both the outer and inner margins are bordered with white; the white border along the inner margin is about one-twelfth of an inch wide, and contrasts strongly with the dark brown colour of the ear; the outer margin terminates below without forming a lobe at the base.

Nostrils projecting, with a deep intervening emargination. The upper lip marked in the centre, as in *Pteropus*, with a narrow vertical groove bounded laterally by naked rounded prominences continuous with the integument of the nostrils.

The ears are naked posteriorly except at their bases; anteriorly, a few hairs appear on the conch along the outer side of the white border of the inner margin of the ear, and, similarly, along the inner side of the white border of the outer margin. On the upper surface, the fur of the back extends upon the wing-membrane nearly as far as a line joining the elbow and knee joints, also, thinly, upon the humerus, the femur, and proximal end of the tibia. Beneath, the antebrachial membrane is covered with moder-

^{*} I have placed the genus Cynopterus next Pteropus as I believe it presents more affinities with that genus than any of the other genera of Pteropids. The species of these genera agree very closely in the form of the nostrils and of the narrow emargination on the upper lip bounded by naked prominences. In Cynonycteris this emargination is wide and deep with slanting sides, altogether very different from the same part in Pteropus. In habit also the species of Cynopterus and Pteropus perfectly agree; they are all strictly frugivorous bats and live in trees, while the species of Cynonycteris are commonly found in caves, and I have been informed that a colony of C. amplesicaudata living near the sea were seen to feed on Mollusca left exposed by the tide.

[†] For a complete list of synonyms of this species see Peters in Monatab. Berlin Akad., 1867, p. 866, and 1869, p. 895.

ately long thinly spread hairs, and the wing-membrane is clothed to about the same extent as on the upper surface, the hairs also passing outwards in a narrow band posterior to the forearm. The colour of the fur is extremely variable, dark brown, reddish-brown, snuff-brown or olive-brown, sometimes with a bluish tinge throughout.

The first upper premolar is minute, and in the centre of the space between the canine and second premolar; the second premolar is about equal to the lower canine in vertical extent.

CYNOPTERUS MARGINATUS, var. ANDAMANENSIS. Pl. XIV, Fig. 5.

This is, I believe, a permanent variety of *C. marginatus*. It is readily distinguished by the small size of the cars which are similarly margined with white. The relative size is very well shown in the accompanying illustration.

Specimens of young individuals of *C. marginatus* from Bengal with forearm bones nearly half an inch shorter than specimens of adult animals of this variety from the Andamans have considerably larger ears.

CYNOPTERUS SHERZERI. Pl. XIV, Fig. 6.

Pachysoma sherzeri, Fitzinger, Sitzungs. Wien. Akad., 1860, p. 389, (nom. nudum).

Cynopterus marginatus, var. Pachysoma Sherzeri, Zelebor, Reise der Oester. Freg.

'Novara,' Saugethiero, p. 11, 1868.

This species, like *Pteropus nicobaricus*, was named but not described by Fitzinger, and Zelebor regards it as a variety only of *C. marginatus*. It is at once distinguished from that species by its small and narrow ears which are also *not* margined with white. When adult specimens of *C. marginatus* and of this species are compared together, the difference in the size and shape of the ears is very striking.

The muzzle is thicker, and the colour of the fur much darker than in any specimen of C. marginatus.

Zelebor mentions that the ears of the specimens obtained at Car-Nicobar are margined with white, but I have been unable to detect even the slightest trace of a white border in the cars of several specimens examined by me. Therefore, either Zelebor has been mistaken, or the white bordering of the ears is not a constant character in this species, or I have wrongly identified the species here described with C. sherzeri. But although it is quite impossible to identify the species here described with that obtained during the Novara Expedition at Car-Nicobar Island from Zelebor's description (which consists merely of some unimportant remarks on the colours of the fur, wing-membrane, and eyes), yet as the animals which furnished the above description were taken not only at the same island—Car-Nicobar—but also from the same place on that island, namely, from the leaves of the cocca-nut palms, I think it highly probable that they

belong to the same species, and, accordingly, to avoid the possibility of introducing a fresh synonym, I have retained Fitzinger's name.

CYNOPTERUS BRACHYSOMA. Pl. XIV, Fig. 7.

Cynopterus brachysoma, Dobson, Journ. A. S. B., 1871, p. 260.

I have little to add to my original description of this species.

The ears are much rounded off above, and the upper third of the outer margin is straight or slightly convex; the presence of a rounded lobe at the base of the outer margin at once distinguishes this species.

The difference in the measurements of the breadth of the ear given with the original description and in the table below is due to the measurement having been taken in the former case across the concavity of the car, ante riorly; in the latter, by means of a string round the convexity, posteriorly.

Nostrils projecting; upper lip with a wide groove in front with smooth not elevated margins; index finger with a distinct claw; metacarpal bone of second finger exceeding, or equalling, the index finger in length; wings from the sides of the hairy back; wing-membrane from the base of the second toe; tail short, distinct.

Dentition:
$$-in. \frac{4}{1}$$
; c. $\frac{1-1}{1-1}$; pm. $\frac{2-2}{3-3}$; m. $\frac{3-3}{3-3}$.

CYNONYCTERIS AMPLEYICAUDATA. Pl. XIV, Fig. 8.

Pteropus amplexicaudatus, Gooff. Ann. du Mus., Vol. xv, p. 96.

- Leschenaultu, Desmarest, Mammal., p. 110.
- " amplericandatus, Temm., I, p. 200.
- seminulus, Kelaart, Journ. As. Soc. Beng., xxi, p. 345.
- , Leschenaultu, Blyth, Cat. Mammal. Mus. As. Soc. Beng., p. 21.

Head long, triangular; upper lip with a wide groove directly continuous with the emargination between the nostrils, the edges of the groove smooth, not thickened as in *Pteropus* or *Cynopterus*; cars moderate, triangular, rounded at the tip, the upper half of the outer margin straight, the lower half convex.

Posteriorly the ears are naked except at their bases, anteriorly the conch is covered with a few very short fine hairs. The fur of the body extends upon the humerus and upon the fleshy part of the forearm, the remaining part to the carpus has only a few very fine hairs. The portion of the back and wing-membrane covered with fur across the loins is not more than an inch in breadth. The interfemoral membrane is densely covered with hair at the root of the tail, and on either side as far as lines drawn from the knee joints to the base of the free portion of the tail; the remaining portion, the legs and a considerable part of the wing-membrane beyond, are clothed with short, thinly-spread fur which extends along the wing membrane and legs

to the back of the feet. Beneath, the ante-humeral membrane is clothed with rather long thinly-spread fur, and the wing-membrane is similarly covered as far as a line drawn from the knee to a point about half an inch posterior to the elbow, whence the fur extends outwards to the carpus. The interfemoral membrane, the legs, and the feet are covered with a few very short hairs.

First upper premolar minute, equally distant from the canine and second premolar; second premolar exceeding lower canine in vertical extent; first lower premolar small, less than half the size of the second premolar; second premolar nearly equal to lower canine in vertical extent.

Hab.—From the Persian Gulf to the Philippine Islands. Bengal; Southern India; Ceylon; Burma; Celebes; Amboyna; Timor; Aru Islands.

CYNONYCTERIS MINOR, n. sp. Pl. XIV, Fig. 9.

Ears smaller and much narrower than in *C. amplexicaudata*; muzzle also proportionately shorter.

The minute first upper premolar is closely wedged in between the canine and second premolar; in *C. amplexicaudata* it is separated by a narrow interval from both these teeth.

The distribution of the fur is somewhat similar to that of *C. amplexicauadius*, but it is much shorter on the wing-membrane and almost absent from the backs of the tibiæ, from the adjoining portions of wing-membrane, and from the fect.

Hob - Java.

		Cynopt	erus.	Cynonycteris.
C, : gin	mar- atus.	C. andama-	C. sherz-C. bra- chysoms.	C. amplexi- caudatus. minor.

tall,	0.7 [0.7	9.9 4.1 0.25 0.6 1.25 1.7 0.6 0.8 0.4 0.6 1.0 1.4 0.4 0.6 2.2 3.2 4.0 5.4 3.0 5.4 3.0 5.4 1.0 0.8	1.7 1.55 0.8 0.68 5 0.55 0.85 1.4 1.3 5 0.6 0.45 3.15 2.8 5 1.0 0.9 5.2 4.4 8.9 3.8
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Nostrils not projecting; upper lip with a shallow vertical groove in front; index finger without a claw; thumb short, part of terminal phalanx included in the wing-membrane; metacarpal bone of second finger equal to the index finger in length; wings from the sides of the hairy back; wingmembrane from the base of the first toe; tuil short, distinct.

Dentition:—in.
$$\frac{4}{4}$$
; c. $\frac{1-1}{1-1}$; pm. $\frac{2-2}{3-3}$; m. $\frac{3-3}{3-3}$.

First upper premolar minute.

EONYCTERIS SPELÆA. Pl. XIV, Fig. 10.

Macroglossus spelæus, Dobson, Journ. A. S. B., 1871, p. 261, pl. x, fig. 3, 4.

When first describing this species, I placed it in the genus Macroglossus on account of its very close resemblance to M. minimus, the type of that genus, in the form, number and arrangement of the teeth. Subsequently, however, in the MS. of a 'Catalogue of Chiroptera in the Indian Museum' I placed it in a separate subgenus 'Eonycteris' on account of the very different attachment of the wing-membrane to the foot and sides. Lately, Dr. Peters writes to me that he is convinced, after a very careful examination of specimens sent to him from the Indian Museum, that the differences existing between this species and M. minimus are of generic importance, and require the formation of a new genus for its reception.

Since I described this species in 1871 I have come to regard the dentition of the Chiroptera as of less importance in their classification than many other characters. I believe that, although the teeth of *Macroglossus minimus* and *Eonycteris spelæa* correspond very closely, these species yet present many structural differences of more than subgeneric importance, and I agree with Dr. Peters that the latter species should be placed in a separate genus. I have, accordingly, raised my subgenus '*Eonycteris*' to the rank of a distinct genus of *Pteropidæ*.

Genus V.—Macroglossus, F. Cuvier.

Nostrils not projecting, upper lip not grooved in front; index finger with a distinct claw; thumb moderate; metacarpal bone of second finger equal to, or longer than, index finger; wings from the sides, their points of attachment separated by a considerable interval from the spine: wing-membrane from the base of the fourth toe; tail very short.

Dentition:—in.
$$\frac{4}{4}$$
; c. $\frac{1-1}{1-1}$; pm. $\frac{2-3}{3-3}$; m. $\frac{3-3}{3-3}$.

First upper premolar nearly equal in size to the second.

MACROGLOSSUS MINIMUS. Pl. XIV, Fig. 11.

Pteropus minimus, Geoff. Ann. du Mus., xv, p. 97.

Macroglossus minimus, Temminck, Monogr. de Mammal., I, p. 191.

Pteropus rostratus, Horsfield, Zool, Researches in Java,

This species is so well-known, and has been redescribed so carefully by Temminck, that no further description of it is here necessary.

It is found in abundance in the deep warm valleys about Darjiling. It extends from India through Burma to the Malay Archipelago.

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DESCRIPTION OF A NEW SPECIES OF VESPERTILIO FROM THE NORTH-WESTERN HIMALAYA,— by G. E. Dobson, B. A., M. B.

VESPERTILIO MURINOIDES, n. sp., Pl. XIV, Fig. 12.

This species is closely allied to *V. murinus* of Europe, from which, however, it is readily distinguished by the following characters:—

The general form of the ear is triangular, with narrow rounded tips: the inner margin is very faintly convex, almost straight, in its upper third, and the outer margin is concave beneath the tip, the remaining portion convex with a faint concavity opposite the base of the tragus.

In *T. murinus* the inner margin of the ear is strongly convex from the base to the tip, the concavity of the outer margin beneath the tip is very feeble, and there is a distinct emargination, almost angular, opposite the base of the tragus, succeeded by a well-developed terminal lobe; the general form of the ear is, moreover, oval, not triangular.

The tragus is slender and acutely pointed, with a quadrangular lobe at the base of its outer margin. In *V. murinus* the tragus is subacutely pointed, and the lobe at the base of the tragus is remarkably small.*

The fur is dark brown above, with light brown tips; beneath, dark brown, almost black, with grayish tips.

The first upper premolar is very small, scarcely visible from without, and not much larger than the second. In *V. murinus* this tooth is distinctly visible from without and much larger than the second premolar.

The specimen (an adult female preserved in spirit) from which the above description is taken, was obtained at Chamba, at an elevation of about 3000 feet, by H. McLeod Hutchison, Esq., H. M.'s 14th Regiment.

[•] The relative shape and size of the ears and tragi of V. murinus and V. murinoides are well shown in Pl. XIV, figs. 12, 13.

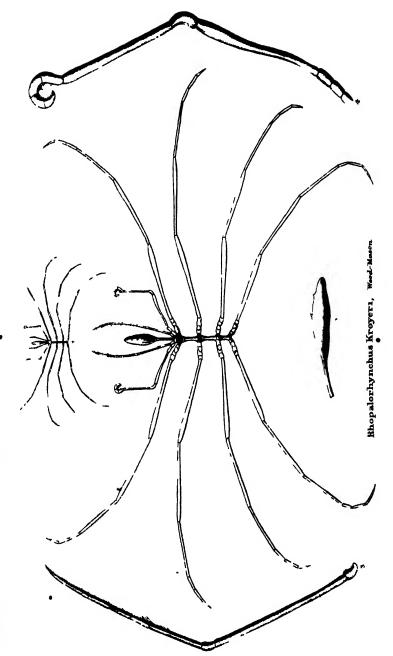
A dried specimen in the Indian Museum, labelled V. murinus, belongs also to this species. It is said in Blyth's Catalogue to have been sent from Masuri by Captain Hutton. The measurements of both specimens compared with those of V. murinus, L. from Europe are as follows:—

	P. murino	des.	V. murinus.	
	8	ę	8	ę
Length, head and body, .		. 5	2.7	8.0
, tail,		.1	1.9	2.8
, head, , ear, (anteriorly), .		. 9	1.05	1.1
,, ear, (anteriorly),		. 85	1.0	1.0
Breadth, ditto,		. 58	0.75	0.75
Length, tragus,		.4	0.1	0.5
Breadth, ditto,		.1	0.12	0.12
Length, forearm,		.1	2.25	2.5
thumb,		.4	0.5	0.5
second finger,		.4	3.3	4.3
n fourth ditto,	2.8 2	.8	2.65	3.3
, tibia,	0.9 0	.9	0.95	1.05
ealcaneum,		.9	0.7	0.9
foot and claws, .	0.5 0	.5	0.5	9.6

The measurements given in the third column are those of a not fully grown specimen of *V. murinus*.

Explanation of Plate XIV.

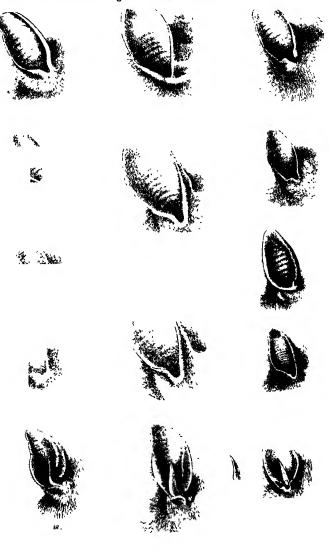
1.	Ear o	f Pteropus medius.
2.	37	" nicobaricus.
8.	"	" edulis.
4.	"	Cynopterus marginatus.
5.	"	" var. andamanensis
6.	99	" sherzeri.
7.	99	" brachysoma.
8.	"	Cynonycteris amplexicaudata.
9.	"	" minor.
10.	"	Eonycteris spelæa.
11.	39	Macroglossus minimus.
12.	**	Vespertilio murinoides.
18 .	**	" murinus.
14.	"	Murina cyclotis.



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- 1. Pteropus medius 2. Pt. nicobaricus, 3. Pt. edulis.
- 4 Cynoptorus marginatus 5. C marginatus, var. andamanonsis.
- 8. C sherzeri 7. C brachysoma 8. Cynonycteris smplexicaudata.
- 9. C. minor. 10 Ecnycteris spelses. Il. Macroglossus minimus.
- 12. Vespertilio murinoiden 13.V. murinus. 14. Murina cyclotia.

JOURNAL

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Part II.-PHYSICAL SCIENCE.

No. IV.-1873.

Descriptions of New Species of Unionide.—By W. Theobald, Esq

[Received July 29th, 1873; read August 6th, 1873.]
(With plate XVII)

UNIO BHAMOLISIS, n. s., Pl XVII, Fig. 1.

Trestá subtriangulato-ovatá, postico-acuminatá, margine ventrali modice rotundato, umbonibus tumidiusculis, lævigatis, pustulis parvis aliquando armatis, decorticatis. Epidermide tenuissimá, lævi, subpolitá, læte viridi, in senioribus flavescente. Testá concentrice subrugatá, lineis paucis sive rugis angustis ligamentum versus plus minusve subradiatim notatá, et antice rugis paucis perbrevibus leviter corrugatá. Dentibus cardinalibus lamellatis, et denticulatis, in valrá dextrá singulo, multifisso, in sinistrá gemino, posteriore triangulari et umbonem juxta posito, anteriore lamelliformi, striato. Nacreá argenteá et iridescente.

Hab. prope Bhamo, regno Birmanico; necnon in Prome occidentali Provincid Pegu.

Lat. 52, alt. 40, crass. 26 mm.

A rare species in Western Prome where alone I have met with it in Pegu, and remarkable for its smooth thin epidermis. The posterior slope alone is conspicuously ornamented with sculpture, but in my largest specimen from Bhamo and in some others also, the peculiar sculpturing of *U. burmanus*, W. Blfd. is faintly but distinctly perceptible over part of the valves towards the umbones especially. A small specimen of 36 mm. from Western Prome exhibits distinctly also the two rows of spines which characterise the next species, so that it seems that *U. burmanus*, *U. bhamoensis*

[No. 4,

and *U. mandelayensis* constitute a natural little sub-group of osculant species at once distinct, but connected and sufficiently distinguishable from any of the ordinary Indian types. I have not, however, felt justified in separating them from the great Indian "corrugatus" group in my forthcoming catalogue of Indian shells.

UNIO MANDELLYENSIS, n. s., Pl. XVII, Fig. 2.

Testâ cuneate subtriangulari, margine ligumentali recto, ventrali, rotundato; valde inæquilaterali: antice lævi, umbones versus leviter corrugutâ; postice ab umbonibus usque ad angulam posteriorem fortiter plicatocorrugatâ. Epidermide lævi, tenui, subpolitâ, glaucâ sive viridi-flavâ, lincis plurimis radiantibus obscure pictâ. Umbonibus decorticatis, granulosis, lincis duobus pallidis 5-6 muricate spinigeris, ornatis. Lincis ad marginem tendentibus, spinis vero vix ad medium valvæ attingentibus. Dentibus sicut in precedente.

Hab. prope Mandelay, regno Birmanico.

Lat. 53, alt. 40, crass. 31 mm.

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In only one specimen have I seen the muricate spines descend below the centre of the valves, but the pale linear bands whereon they stand usually descend to the margin.

The peculiar sculpturing of *U. burmanus* is also seen in this species though less strongly marked and though sometimes carried over a good portion of the valves, yet is usually most pronounced on the posterior slope.

UNIO FEDDENI, n. s., Pl. XV., Fig. 3.

Testa quadrato-ovali, concentrice sulcata, antice gibbose rotundata, postice dilatata, subtruncata; parum inæquilaterali. Umbonibus decorticatis, haud prominentibus. Epidermide lævi, subpolita, viridescenti-flava. Dentibus cardinalibus lamelliformibus, striatis; in valva dextra singulo, serrato, in sinistra geminis triangularibus, striatis et serratis. Nacrea cærulescentialbida.

Hab. in Peemgunga fluvio, India centralis. Teste F. Fedden.

Lat. 40, alt. 29.5, crass. 19 mm.

This very peculiar and marked form which somewhat recalls by its outline the American *U. securis*, seems a rare species and was collected sparingly among numbers of fine specimens of *U. wyngungensis*, Lea, in Central India by my colleague Mr. Fedden after whom I have named it. It falls naturally within the great "corrugatus" group, though there are few better marked varieties than it.

Unio gowhattensis, n. s., Pl. XVII, Fig. 4.

Testa quadrato-ovata, antice rotundata, postice declive truncala, margine ventrali recto. Umbonibus decorticatis. Epidermide fluvescente, postice

viridescente. Testa concentrice striata et rugis plurimis minutis valde approximantibus angulariter seu fulgurate granuloso-crispata, postice tantum radiatim granuloso-crispata. Dentibus cardinalibus bifidis in utraque valva. Nacrea cærulescenti-albida, iridescente. In senioribus granulationes valde inconspicuæ funt.

Hab. prope Gowhatti in Assam.*

Lat. 39, all. 25 5, crass. 18 mm.

The only other *Unio* that I am acquainted with possessing the peculiar fulgurate and granulose sculpture of this species is *U. crispisulcatus*, B., and to that group it must be referred, for greatly as the two species at first sight would seem to differ I have little doubt that intermediate forms connecting them will eventually be discovered. Fig. 4a represents the sculpture enlarged and fig. 4b that of *U. crispisulcatus*, B. for comparison.

MONOCONDILLIA AVE, n. s., Pl. XVII, Fig 5.

Testá oblonyá, solidiusculá, antice rotundutá, postice curvatim truncatá. Marqine ventrali recto; ligamentali convexo. Umbonibus decorticatis. Epidermide piccá, in junioribus luteo-flavescente lineis tenuibus obscure radiatim notatá. Testá incrementi lineis concentrice rugatá, postice plicis paucis raro notatá et valde evanescentibus. Dentibus minimis ut in M. salweniana. Nacreá cærulescente, umbones versus flavescente.

Hab, prope Mandelay regno Birmanico.

Lat. 96, alt. 52, crass. 28 mm.

This species differs considerably from the ordinary forms of *M. salweni-* ana by its great smoothness and its elongated form. It resembles in the former respect the Philippine *M. Cumingi*, Lea, and young specimens sometimes exhibit a trace of faint sculpturing along the posterior slope much as in *M. inoscularis*, Gould, but all the adults I have seen have been quite devoid of sculpture.

SPILCRIUM AVANUM, n. s., Pl. XVII, Fig. 6.

Testa quadrate rotunda, tumida, antice rotundata, postice truncata, dilatata, equilaterali. Epidermide, leviter et concentrice corrugata, postice levissime radiata. Umbonibus prominentibus, tumidis, osculantibus; colore pallide stramineo, tribus fasciis purpureis umbonalibus radiatim picto. Liqumento umbones versus inflato.

Hab. prope Ava.

Lat 7 5, alt. 6.6, crass. 5.2 mm.

A single specimen of this rotund or pisiform species occurred among a number of specimens of *Corbicula* and other fresh-water shells received from Ava.

• Obtained by one of the collectors of the Indian Museum.—[Ed.]

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On the muddy Water of the Hugli during the rainy season with reference to its purification and to the Calcutta Water supply.—By D. Waldie, Esq.

(Received Oct. 29th; read Nov. 5th, 1873.)

CONTENTS.

- I —Introduction,—construction of the Filters at Palta, difficulties in their working—question as to the cause of this,—true cause, according to the author, is the peculiar nature of the water.
- II.—Desirable ass of explaining the reason of this peculiarity,—considerations which led to its discovery,—its nature,—experimental evidence in proof.
- III .- Corroborative evidence from other sources, direct and indirect.
- IV.—Details of experiments connected with it and results.
- V .- Further corroborative evidence and additional explanatory remarks.

I .- The works for the supply of Calcutta with water have been in operation since the early part of 1870. The nature and arrangement of the filtering materials in the filtering tanks at Palta were decided upon chiefly from the results and conclusions to which I came after a series of experiments made during the rainy seasons of 1869 and 1869, for the purpose of ascertaining what was likely to be most suitable and efficacious for filtering the muddy water of the Hugli during the floods that extend from June to September or October annually. These experiments also included an examination of the value of a particular contrivance called Spencer's Regulating Cup, to which great importance was attached by the Engineer who designed the works. The general conclusions to which I came were, that this Regulating Cup possessed no special value, for that the retardation of the flow of water which was stated to be its particular function could be attained equally well or better by other means; and that the better sand of the two kinds submitted to me for comparison was the fine sand from the sand-bank in the river, which, as it could be obtained on the spot, was called Palta sand. The other sand, called Magra sand from the locality at which it was found, was considerably coarser in grain, and was stated to be more like that used for filters in England. Though well enough aware of this, I decidedly preferred the Palta sand for filtering the muddy water of the rains, which was the period of special difficulty. For the remainder of the year, I considered it of little importance which kind of sand should be used.

In accordance with my recommendation, the filters were fitted up with Palta sand and without the regulating cups. They worked well during the first rainy season; but afterwards, particularly during last season (1872), there was so much difficulty in getting water filtered through them sufficiently

clear, and in the required quantity, owing to the largely increased demand, that they were pronounced a failure by the Superintending-Engineer, who advocated a trial of the coarser sand combined with the Regulating Cup, with, as he said, assurance of success, and in the view of adapting this arrangement to the whole eight filters if found satisfactory.

No more complete condemnation of the arrangements I had recommended could well have been made. Reasons were given for it, of which I need only state the principal. The Palta sand was too fine, and consequently rapidly became choked up; such sand was not used in England. It was a principle laid down by Engineers that the muddy particles should not penetrate more than an inch or two below the surface of the sand; this was not the case here, as they penetrated deep into the sand, and made it foul throughout. The fine sand retarded the flow of water too much, and speedily became choked up by the deposition of mud; the proper retardation and regulation of the flow should be effected from below, either by a greater depth of coarser materials, or by the use of the Regulating Cup.

My replies to these reasons were that the fine sand was not too fine for the water which was to be filtered, and that if not used in England, neither was such water filtered in England. This mud of the Hugli water during the rainy season could not be prevented from penetrating deep into the sand, at least if the water were to pass at such rate as would be practically of use; that the choking up of the sand to a certain extent, instead of being an objection, was essential to its proper action as a filter for this water, and the object should be not to prevent but to regulate it,—and that it could be prevented neither by a greater thickness of coarse material nor by regulating cups. And, further, that the difficulty and consequent great amount of labour and trouble in filtering the water during the rainy season was caused, not by the particular arrangement or nature of the filtering materials but by the nature of the water itself; and, consequently, that the proposed remedy was entirely delusive, and would certainly fail.

Though no formal opposition, so far as I am aware, has ever been made to my statements or opinion respecting the quality of the water, neither has the conclusion been formally admitted as correct, and it has been overlooked or neglected in all reasoning on the subject, at least as a sufficient explanation of the difficulty. The principles of sand-filtration were appealed to, and these were explained to depend chiefly on the attractive power of the coarser particles of sand for the finer particles of the mud suspended in the water; and this was represented as the most important part of the process,—" such is, in fact, filtration,"—apparently almost to the exclusion of what was called mere straining. This explanation I hold to be totally erroneous. The most important part of the process is straining, the prevention of the passage of particles through narrow crevices between the grains of sand; next is depo-

sition by gravity, on the upper surface of these granules, of still finer particles;* and last, and least important of all, is the mutual attraction of particles of mud and sand independent of gravity. The influence of all. of these processes will be affected by the greater or smaller size of the particles of mud in suspension, and the difficulty in getting the water to pass clear will be the greater the smaller the particles are. Hence the great difficulty with the water in question, the particles being so very fine.

II.—The peculiarity of the Hugli water from June to October I had always connected with the tropical rains and melting of the snows at the sources of the Ganges, occurring together so as to form one great flood of four or five months duration, instead of occasional floods to which rivers of European countries are subject, exceeding these greatly both in amount and in duration. I had not, however, been able to offer any other than conjectural explanations of its slowness in clearing by settling and of the difficulty in filtering it, of which I had found abundant evidence as a matter of fact. Attention having been again directed toward the subject by the circumstances previously referred to, I was led again to think of the advantage it would give me to be able to state some reason for my belief that the cause of difficulty lay in the nature of the water; some explanation of this peculiarity,-a reason why it should be so,-some generalisation shewing that it was not an isolated fact, but one of other similar facts admitted and acknowledged. Indeed, ever since it had been so foreibly brought under my own notice by my filtration experiments, and fixed in my own mind at least as a certainty. I had been alive to everything, old and new, that appeared to have a bearing on the subject, whether it were practicable means of purifying the water or a way of explaining the difficulty.

With respect to purifying muddy water generally there were certain methods which were well known and others less generally. The use of alum and other salts of alumina for such a purpose had long been known: salts of peroxide of iron, a substance chemically having much analogy with alumina, had more recently been introduced, and in my opinion they were even superior to salts of alumina. These substances act by the alumina or peroxide of iron being separated from its combination with the acid by alkaline matter which might be added along with them, or by the action of the carbonate of lime present in many waters, or even simply by large dilution, as in this case the base tends to separate from the acid. The alumina or oxide of iron separates in loose soft flakes which envelop or attract the fine particles of the mud, and carry them down with them, leaving the liquid quite clear. Indeed many other substances that produce flocculent precipitates by the addition of another substance have the same effect; thus by adding a solution of sulphate

Well illustrated by Wahklyn and Chapman in the 2nd edition of their treatise on Water Analysis.

of copper, and then a little soda, oxide of copper is thrown down carrying the mud with it. I have, indeed, made use of this method for precipitating the fine, suspended mud for chemical examination; the oxide of copper being removed from the precipitate, after collection, by ammonia and acetic acid, and the mud washed. This process, when the precipitants are employed in proper quantity, is speedy and convenient.

There is another class of substances which operate in a similar way, namely, alkalies and alkaline earths, such as Soda and Lime. These combine with the carbonic acid that keeps carbonate of lime in solution, which becoming insoluble is consequently precipitated. When Lime is used an additional quantity of carbonate of lime is produced. This, in fact, is Dr. Clark's well-known process for softening such waters as owe their hardness to carbonate of lime in solution. The precipitate formed carries down other matters with it leaving the water clear. The objection to the use of this process is the large quantity of additional sediment produced, and the risk of some prejudicial effect on the quality of the water, at least if not carefully managed.

Another class of sub-tances the mode of action of which is not so evident, is acids. I do not know when this was first noticed. Graham, Miller, and Hofmann in their Report on the London waters, June 1851, speaking of the impurities, refer to "this clay tinge which resists the action of acids." Whether from this hint or not, I do not recollect, but I myself employed acids in 1866 for the purpose of clarifying the muddy waters of the Hugli during the rains.* A small quantity of Nitric or Hydrochloric acid added to a large bottle of muddy water so altered and precipitated the mud that next day, or even in a few hours, it could be filtered clear with ease. I used alkalies, also, and perchloride of iron; but did not prosecute the subject further, my object having been simply to get the water clear with as little addition of foreign matter as possible; and nothing was better than a little of these acids.—even of acetic acid.

There is yet another class of substances the action of which is equally if not more difficult to explain, namely, those substances usually called neutral salts, both alkaline and earthy. The first direct notice I found of this was in some remarks in the 'Chemical News' of 3rd April, 1868, by Mr. W. Skey, Chemist to the Geological Survey of New Zealand, on the property of this class of substances to clarify muddy water. In this he specifies that I grain of common salt clarifies 5 ounces of muddy water and 1 grain of chloride of calcium or barium 10 ounces, 1 grain of lime 15 ounces and 1 grain of sulphuric acid 50 ounces. He thinks that these substances must act solely from their affinities for water, as it is not at all likely that they undergo any decomposition themselves. In the Chemical News' of 8th Journ. As. Soc. Beng., 1867, Vol. XXXVI, Pt. II, p. 7.

July, 1870, is a short abstract from the 'Comptes Rendus' of the Academy of Sciences, of 20th June 1870, of a paper by Dr. C. Schloesing on the same subject, in which, it is stated, he refers to river waters contaminated with clay being readily clarified by 1000th part of chloride of calcium or other salts of lime, and being then readily filtered, while previously they rapidly choked the filter. He refers to several rivers, such as the Rhine in its lower course and the Durance which supplies Marseilles, as being notorious for this peculiarity. Then in the same Journal of 12th May, 1871, Mr. Skey notices this as a re-discovery on the part of Schloesing, and says that 1 grain of chloride of calcium is sufficient for 10 ounces of muddy water or 50,000 grains, an evident misprint for 5000 grains. He also notices a paper on the so-called molecular movements of microscopic particles by Professor Jevons, who has some theory about this coagulation of clay being due to the water becoming by such addition a conductor of electricity, and the clay particles charged with electricity.

Besides all these direct observations, there is a phenomenon which had long (long before these observations were made) come under the observation of chemists in filtering and washing certain precipitates and sediments, namely, that for a time, while there is saline matter present in solution, the filtered liquid comes clear, but when, by continuing to wash such substances by distilled water, these saline matters become much reduced in quantity, then the filtered liquid flows muddy, the solid substance passing in a state of very fine division through the pores of the filtering paper. The chemist to avoid this adds a proportion of some saline substance (such as chloride of anmonium or muriate of ammonia) which will not interfere with his subsequent proceedings, and so is enabled to wash the sediment or precipitate free from everything except the substance which he has added. He can get rid of this afterwards by other means if it be necessary. This peculiarity especially occurs with clays and substances more or less analagous to them, such as Zirconia and Titanic acid. Another illustration is given when we attempt to extract the saline matters soluble in water from clayey soils. When the soil is first mixed with distilled water and allowed to settle, the supernatant liquor may be clear: if this be poured off and more distilled water be mixed with the residue, it will not settle and clear so readily, and if the process be repeated, it may take a very long time to do so. Just in proportion as the saline matter is removed, the fine clay separates with greater difficulty from the pure water.

It is to be observed that the substances here referred to, namely, neutral salts, are just the same sort of matter that exists in natural waters in small quantity. Reflecting on the difficulty, with the impression of the abovementioned facts on my mind, on or about the 1st August last, the question occurred to me: How small a quantity of such substances is sufficient

so to change the character of the mud in the river water of the rains as to enable it to settle with sufficient readiness, and in such a state as to render the water capable of being filtered without difficulty? Will the difference of quantity between that of the saline matter which exists in the water of the rainy season and that, say, of December be sufficient? Will the addition of such small quantity of the same kind of saline matter that exists in the river water to the water of the rainy season, so change its character that these difficulties in settling and filtering will be removed? Without delay a few experiments were instituted and their results observed, and these results showed that the question was solved in the affirmative and the whole difficulty cleared up. The Hugli water during the rains contains too much pure water in proportion to its saline constituents, or these natural precipitants are present in too small quantity to precipitate the mud, as they do in other localities which have no tropical rainfall to produce so great dilution. And now my previous conviction as to the cause of the peculiarity was at once confirmed and explained.*

The first experiment was made by means which came at once to hand. One quarter of a litre of muddy water from the river was mixed in a bottle 1 with an equal volume of water from a tank which, in the dry season, I had found to contain a considerable quantity of saline constituents. Now, from the rains, I knew that it must be considerably more diluted, nevertheless not so diluted as the river water. In another bottle, for comparison, was mixed an equal quantity of the river water with the same volume of distilled water. It seemed natural to think that this mixture with distilled water would settle most speedily, more particularly as the tank water contained much glutinous vegetable matter; nevertheless, notwithstanding this disadvantage, the mixture with the tank water settled best. It was not a very good experiment, yet the result was quite distinct.

Then solutions of sodium and of calcium chloride (common salt and muriate of lime) were prepared of known strengths. The amount of saline constituents in the river water during the rainy season was pretty well known from former analyses, and these solutions were added in such quantity as approximately to double the quantity of saline constituents in the water, and thus bring it near the composition of the river water of December as regards alkaline and earthy salts. This produced an improvement in the settling, very slight in the case of common salt, very decided in that of chloride of calcium (muriate of lime). This at once shewed, what was afterwards abundantly confirmed, that lime salts were much more efficacious than alkaline salts. I shall return to this part of the subject further on.

At the meeting of the Society on 4th August last I intimated that I had discovered what I believed to be the true explanation of the difficulty with the water. Vide Proceedings for August, 1873.

Another obvious-looking plan was to dry a measured portion of the water and add its solid constituents to an equal quantity of water, so as to double the total amount. But there were practical difficulties in this process, in the changes the constituents would undergo by evaporation; it was, however, done thus: a portion of filtered water from the Calcutta hydrants was concentrated by evaporation over the water-bath to one-fifth of its volume; after this carbonic acid gas was passed through the concentrated liquor in order to redissolve the carbonates of lime and magnesia which had separated. One volume of this concentrated water was now mixed with four volumes of muddy river water, so as to make up the original quantity. This mixture, on being allowed to stand, settled well and the water could be filtered easily. In all cases a similar bottle of the muddy water, unmixed with anything, was placed beside these mixed waters for comparison.

In all the above experiments the waters were allowed to stand 24 or 48 hours to settle. This was a point I had calculated on, as the object was not to clarify the waters as rapidly as possible, but to imitate the settling and clearing of other natural waters or of the Hugli water itself during the dry season, by assimilating its composition so far as regards soluble salts to that of those.

III.—I have examined the tables given in Bischoff's Chemical Geology* of the composition of various river waters for anything to be found bearing on this subject, and the author's remarks connected with rivers. The varieties of composition are obvious, and a few rivers are to be found containing but a small quantity of saline constituents and particularly of earthy salts in their waters. In a few cases the composition is given at different localities or at different periods of the year, but generally there is not enough of information to connect these facts with the subject under consideration. Two analyses of the Rhine water at Basle and at Strasburg shew fully 14 parts of Carbonate of Lime and Magnesia in 100,000: again at Bonn in March, 1852, there are fully 10 parts; in March, 1857. only 41 parts; but in the former case the river was very low and of the usual clearness, in the latter it was much swollen and very turbid. Bischoff has a chapter on mechanical deposits from water, in which he notices various particulars respecting rivers. Of torrents which issue from glaciers, he says, all of them roll along in a turbid grey milky or dark stream according to the nature of the pulverized rock. Generally speaking, in rivers, the quantity of suspended matter increases with the height of the water, and the substances dissolved diminish. The suspended matter consists generally of clay, but in limestone districts it may consist partly or chiefly of carbonate of lime itself. Of course even water containing a considerable quantity of soluble salts of lime may be muddy, but if the mud consist of clay, the mud

^{*} Cavendish Society's Trans., 1854.

will settle readily by repose. If the suspended matter in such waters consist partly or chiefly of carbonate of lime, how it will be affected by the soluble salts present I am not prepared to say, as I have had no opportunity of examining such waters. A French author, whom I shall quote presently, speaks of waters which are never clarified entirely by repose; such are, as he calls them, "les eaux blanches de Versailles," which owe their milky tint to their contact with layers of calcareous marl. Whether these waters contain soluble salts of lime or not, I do not know.

In a note to the chapter referred to, Bischoff mentions that Th. Scheerer* had found that "the deposition of suspended matter is hastened when cer"tain salts—alum, sulphates of copper and iron—are dissolved in the water.

"But since a solution of chloride of sodium behaves like pure water, it can"not be expected that the suspended matter is deposited more quickly in
"the sea than in rivers." Now here is a mistake, for solution of chloride
of sodium does not behave like pure water. Mr. Skey, more correctly, thinks
that the transparency of the sea may depend on the precipitation of mud by
the saline matter. Scheerer's observations must I think have been too hastily or imperfectly made.

The French works just referred to,† very valuable no doubt for what they were intended, principally engineering, did not, however, contain much of the sort of information I was in search of. That by Darcy gave me some worth noticing. It contains accounts of the filtering operations at Chelsea, Southwark, Thames Ditton, York, Hull, Paisley, Glasgow and Marseilles, also of the natural filters of Nottingham, Perth, Toulouse and Lyons. The natural filters are out of the range of the present enquiry, the first four appear to be on a similar plan to those at Palta, the latter three are different in their arrangements for cleaning the sand. Those of Gorbals, Glasgow, are not sufficiently well described, those of Paisley are; in both the clearing is effected by passing the water from below upwards, but, as the nature of the water is not at all likely to have any analogy with the water under consideration, I need not notice them. The filters at Marseilles, however, are worthy of a little attention. The water which supplies Marscilles is derived from the Durance. This water, as well as that of the Rhone, judging from the description, must have a considerable similarity to that of the Hugli during the rains, at least during certain periods, requiring a long time to settle and become clear. From some things stated in the account of the filtering operations, however, I do not think that the particles of the sus-

In Poggendorff's Annalen, Vol. 82, p 419, date unknown but previous to 1854.

[†] Traité de la conduite et la distribution des eaux, par J Dupuit, Paris, 1854 and Les Fontaines publiques de la ville de Dijon par Henry Darcy, Paris, 1866, both beautifully illustrated by plates. For inspection of these I have to thank Dr. Tonnerre, Health Officer to the Municipality.

pended mud can be so very fine as those of the water of the Hugli during the rainy season. There are unfortunately no analyses, but as they come from Alpine regions they must be often diluted with much pure water from melted snow.

The whole thickness of the bed of filtering materials is only .8 metre or about 2 feet 8 inches, of which the upper layer is .3 metre or about 12 inches, consisting of very fine sand (Sable très fin de Montredon), below which are layers of middling and coarse sand, gravel and broken stones. It is stated that the filters might work more than eight or ten days, but if kept going longer they would be more difficult to clean. This cleaning is effected by passing the water backwards and upwards through the sand, the impure water being carried off from the surface by channels for the purpose. I have to observe that here we have filter beds much thinner than those at Palta, very fine sand and upward charging, all points that have been considered objectionable for the Palta filters. The cleaning by upward charging requires considerable velocity of current and a continuance of it for four or five hours of time. I have calculated from the data given that it would require about 14 or 15 feet of perpendicular height of water, that is, about as much water as one of the filter tanks, emptied of its filtering materials, would hold two and a half times. No account is given as to how it is done, but I concluded that the level of the canal from which the water is supplied to the filters must be sufficiently high for the purpose.*

I can also bring confirmatory evidence of another kind from English waters, evidence to show why these waters are not attended with such difficulties in their filtration. There are no circumstances to produce such muddy waters as are to be found even on the European continent, no Alps and glaciers to produce this muddy water even at its source, no mountain snows to melt, and no large falls of rain concentrated in one period. I refer to a paper by Dr. Frankland+ on the water supply of the Metropolis during the year 1865-66 In this paper there are several tables of the principal constituents of the water of nine Water Companies for every month of the year. These tables shew that the amount of saline constituents varies during the year, but never to near such an extent as that of the Hugli: they also shew that the earthy salts vary in their amount as indicated by the hardness, but never become reduced to nearly the same degree as those of the Hugli, being at their lowest indeed nearly as much in amount as those of the Hugli in December or January. The variation of course depends upon the rainfall, but this does not vary as respects either quantity or time in the same

^{*} I have since been informed by Dr. Tonnerre that the level of the canal is high above the town.

[†] Journ. Chemical Society, 1866, Vol XIX, p. 289.

way as it does in the valley and the source of the Ganges; in England the rainfall and hardness both rise and fall repeatedly during the year. The case is entirely different from the state of matters here in which we have a very soft water from the commencement of the regular rains gradually becoming harder in November and December and continuing so till the rains set in again in the following year. There is no reason, therefore, to expect any noticeable disturbance in the conditions of tiltration in England from change in the condition or nature of the water, but every reason to expect it here, if we can only suppose or admit that such a change in the water may affect the filtration. And I would ask, why we should not admit that it should do so? My experience convinced me that it did so affect the filtration, and though I could not satisfactorily account for it or explain how it did so, I continued firmly to maintain that it did so, that this was the true cause of the difficulties, and that consequently other explanations were fallacious and baseless.

I should have been glad to have found other corroborative evidence of the correctness of my opinions, but had no means of obtaining it. Fortunately the discovery of the nature of the peculiarity rendered this of comparatively small importance. I return now to the consideration of this subject a little more in detail.

IV.—After ascertaining that such a very small quantity of lime salts or rather of chloride of calcium, for that was the salt experimented with at first, was sufficient for the purpose required, I proceeded to compare the efficiency of different neutral salts. For this purpose I had to choose a standard of comparison, and as the enquiry related at present to the Hugli water, I chose it with reference to the composition of this. Chloride of Sodium or common salt might have been taken, but I found its effect comparatively so small that I gave that up. The really influential constituents in the river water were the salts of lime and magnesia, particularly the carbonates, and as I found that these were of nearly equal power, I decided to take that which existed in largest quantity, namely carbonate of lime, as the standard of comparison. But as a solution of carbonate of lime in excess of carbonic acid is troublesome to prepare, its strength somewhat troublesome to ascertain, the solution itself weak, consequently involving the addition of a notable quantity of water, besides being liable to change, I chose for my working standard a solution of chloride of calcium equivalent in strength to-1 grain carbonate of lime in 50 cubic centimetres of solution, equal to 1.11 gm. chloride of calcium in 50 c. c. This formed a convenient strength for measuring by a pipette. For the composition of the water, I assumed that. during the rainy season it contained salts of Lime and Magnesia equivalent gatogether to 7 grains of carbonate of lime in 100,000 fign. or '07 gramme in 1 litre. This is equal to 4.9 grains in 1 gallon. Perhaps it is rather too. low an estimate, 8 grains or even 9 grains to 100,000 being possibly more correct.

A question soon arose as to what was the general nature of the action, for on that I must regulate the plan on which I was to compare different substances. I have quoted Professor Jevons's electrical theory about the coagulation of clay, which is too speculative for practical application,—also Mr. Skey's, that these precipitating substances must act solely from their affinity for water, because the powerful affinities of the component parts of most of these substances precluded the idea of their decomposition. The general tendency of the experiments I made at first, however, led me to reject this explanation, and to conclude that the action was most probably a chemical one, though it might be difficult, or at present impossible, to explain exactly how it operated. In consequence of this I decided to compare, not absolute weights of the different substances, but their chemical equivalents. Reasons for this conclusion will be given presently.

I generally operated on half a litre of water. This was mixed with the substance to be tried and allowed to stand from 24 to 48 hours. A row of such bottles with different substances was placed on the table with one bottle containing unmixed water, and comparison was made of their respective appearances at the end of a certain time, sometimes of two or three times, and the result noted. Different proportions of the same substance were compared in the same way. The conclusions were drawn only from the experiments made on the same water at the same time, not between different samples of water or between observations made at different times.

The substances compared were chiefly, but not exclusively, those found in natural waters. They may be divided into the following classes:—

Alkalies and alkaline earths.

Acids, or Hydrogen salts.

Neutral salts of the alkalies.

Salts of Lime and Magnesia,—or of alkaline earths generally.

Salts of protoxides of heavy metals, namely of 1ron, Manganese and [Copper.

Salts of the sesquioxides, - namely of Aluminum and of Iron.

The range might have been considerably extended, and the series have been more complete, but I could not spare the time necessary for a more numerous series; besides, the river water began to improve about the end of August and continued to do so, as the rains ceased early. The experiments, however, were sufficiently numerous to enable me to draw conclusions of interest.

I shall arrange the substances tried in a tabular form, attaching to them numbers indicating the number of chemical equivalents necessary to produce the same effect as Carbonate of Lime in solution in carbonic acid water. The equivalents will be in relation to the atomic weight of chlorine 35.5; thus,—combined with Sodium 23, Calcium 20, Iron (Ferrosum) 28, (Ferricum) 18.66, forming Sodium Chloride 58.5, Calcium Chloride 55.5, Ferrous Chloride 63.5, Ferric Chloride 54.16, so that equivalents can easily be converted into absolute weights by multiplying by these numbers, and to facilitate this the equivalent numbers are given. The absolute weights are also given in the last column which, it will be observed, are the products of the two first multiplied by 2 to bring them to the standard of Carbonate of Lime taken as 100, the double of its equivalent. The equivalents and absolute weights, also, are all for the substances free from water of combination, crystallization or solution.

Table of approximate quantities required to produce an equal effect in clarifying the muddy water:—

Chemical equivalent. 58 5 56.0 84.0 60.0	Number of equivalents. 40.0 · 5.0 4.0	Absolute weight. 4680 560
56·0 84·0	5.0	560
84.0		
	4.0	
60.0		672
	3.0	360
49.0	2.0	196
55 ·5	2.0	222
4 5· 5	2.0	182
c3.0	1.5	189
104.0	1.0	208
500	1.0	100
		•
42.0	1.0	84
68.0	1.0	136
75 ·5	•5	75.5
79.5	: 23	31.8
76·0	.15	22.8
58 <u>·</u> 0	.15	17.4
79 2	.05	7.92
44 ·8	·05	4.48
5 1 ·7	.025	2.74
	49·0 55·5 45·5 C3·0 104·0 50·0 42·0 68·0 75·5 79·5 76·0 58·0 79·2 44·8	49.0 2.0 55.5 2.0 45.5 2.0 45.5 2.0 63.0 1.5 104.0 1.0 50.0 1.0 42.0 1.0 68.0 1.0 75.5 .5 79.5 .2 76.0 .15 58.0 .15 79.2 .05 44.8 .05

Chloride of Potassium or Muriate of Potassa, Sulphate of Potassa, Acetate of Potassa and Phosphate of Soda were about equally efficacious .with common salt.

This table shews the very great difference in efficiency between different substances, common salt having only one-fortieth part of the power of the standard Carbonate of Lime when chemical equivalents are compared, or about one-forty-seventh part when actual weights are compared. On the other hand, Perchloride of Iron is forty times as powerful as Carbonate of Lime, chemical equivalents being compared, or about thirty-six times when actual weights are taken.

A glance at the table will show that the precipitating power is just in proportion to the facility with which the acid and basic constituent of the salt can separate. The alkalies and alkaline earths ought to be excluded as they exert a chemical change in the soluble constituents of the waters, but it appears to me pretty evident that both the acid and basic constituents of the remainder of these substances take part in the effect produced on the clay. Acids themselves do so, as shewn by the table, even so very weak a one as Carbonic acid gas does so when passed for sometime through the muddy water, as I found from direct experiment. And I also found that when using these small quantities of alumina, the addition of a proportion of potash, more or less, to neutralize the acid constituent of the salt was no improvement but the reverse. Pieces of sheet iron, immersed in a bottle of muddy water and shaken occasionally, in a few hours caused the mud to precipitate very well; the iron evidently had been acted on by the Carbonic acid in the water and the atmospheric oxygen to form a small quantity of a salt of iron which produced the effect.

The numbers in the table are by no means to be taken as accurately ascertained. The shortness of the period during which muddy water of nearly similar quality was available rendered this impossible. After the end of August, I employed water from the river mixed in a vessel with the muddeposited from previous water and stirred up, which can scarcely be taken as a very good representative of the water during the worst period of the rains, though probably good enough for the purpose, as the comparisons between different substances were always made with the same water. But as the month of August was chiefly occupied with experiments on the natural constituents of the water, namely alkaline and earthy salts, and those on the effects of the salts of the heavy metals and of the sesquioxides were not made till September when the water had undergone some change, the numbers given for these latter are not quite so certain, possibly may be stated as smaller than they would have been had the August water been used. The decision on this point must be reserved for next rainy season.

It may be well also to state the absolute quantities of these or at least of some of these substances that would be necessary to clarify a given quantity of the muddy water, calculated from the data given. For this purpose the standard will be Carbonate of Lime, dissolved by Carbonic acid, in the

proportion of '07 gramme to 1 litre or 1000 cub. centimetres or 7 pounds to 100,000 pounds of water, which is equal to 700 pounds to 10 million pounds of water or to 1 million gallons. From this the quantity of any other of the substances given in the table may be calculated from the last column by simple proportion. Thus as 100 Carbonate of Lime is to 700 pounds required, so is 136 Sulphate of Lime to 952 pounds required, or 2.74 Perchloride of Iron to 19.18 pounds required for 1 million gallons of the muddy water of the Hugli.

It is necessary to remember, however, that the table given refers to the dry substances, which is the natural condition in which they are usually found in only a few of the substances enumerated in the table, such as Common Salt and Carbonate of Lime. Most of the other substances contain water of crystallization or water of solution, which last may be a very variable quantity. In the latter case the quantity of dry matter in solution must be known. The following table includes a few of the preceding substances most likely to be of practical application:—

Table of absolute quantities of substances necessary for the clarification of 1 million gallons of muddy water of the Hugli during the rainy season, calculated from the data given above.

	Pounds.
Common Salt, dry, equiv. 58.5,	32,760
Chloride of Calcium or Muriate of Lime, fused or dry, eq. 55.5,.	1554
Carbonate of Lime, dry, eq. 50,	700
Gypsum or native cryst. Sulphate of Lime, eq. 86,	1204
Sulphate of Iron cryst., eq. 139,	159·6
Alum cryst., eq. 151.2,	55· 4
Perchloride of Iron, dry, 54.7	

It may be also worth noting the proportion of a few of these substances to the water, on the above data.

Common Salt,	1 to	305
Gypsum,	1 to	8,306
Carbonate of Lime,		
Perchloride of Iron.*		

These numbers shew that chloride of calcium is nearly twenty-three times as effective as common salt. Skey estimated it as only twice as effective. Schloesing, as will be stated immediately, estimated chloride of potassium as of only one-fifth of the efficacy of lime salts and chloride of sodium.

• On referring to my Note Book I find that in July 1866, I had come to the conclusion that about 1 of Perchloride of Iron is sufficient to precipitate the mud from 125,000 of water by standing over night, an approximation at least to the small quantity I have recently found to be sufficient. This was when I was not thinking of its application on the large scale nor searching for a minimum.

weaker still. It will be observed that my numbers differ widely from theirs. The differences are to be accounted for, partly from the circumstance that my examinations have been pushed further than theirs, thus shewing that one lime salt is twice as efficacious as another, that some other salts are far more powerful than lime salts, and that the salts of the heavy metals and particularly of the sesquioxides seem to act on the same principle, which does not appear to have been suspected by either Skey or Schloesing, at least is not alluded to. It is also probably partly due to the differences of the mud operated on, both as respects the composition of the insoluble matter it chiefly consists of, as well as of the soluble matter that it may contain.

V.—I had written thus far when I had an opportunity of seeing Schloesing's paper in the original, in the Comptes Rendus, and found it much more complete and interesting than I could have concluded from the brief abstract in the Chemical News. He was first led to notice the peculiarity from a circumstance I have mentioned before, namely the treatment of argillaceous soils with distilled water. He not only mentions that distilled water rendered muddy by a mixture of purified fat clay is precipitated by 1-1,000th part of lime salts immediately, but that this is the case also by 1-5,000th part in some minutes and by 1-50,000th part in two or three days. He refers to the muddy water of the Seine becoming limpid in an hour or two by a very small addition of a lime salt, but at the same time states that the Seine water contains 89 milligrammes of lime per litre, equal to 8.9 parts in 100,000 or 15.9 of Carbonate of Lime, a much larger quantity than that which exists in the Hugli water during the rainy season, indeed nearly as much as is found in December and January. Schloesing further directs attention to the influence of this peculiarity on clay soils and on what is called the mechanical analysis of soils; and he further notices the precipitation of mud so carried in rivers by the water of the sea, and also the practical applications suggested by it for clearing muddy water. Indeed he concludes by a reference to the waters of the Durance employed for supplying Marseilles, tracing the muddiness of such waters to their sudden dilution with large quantities of pure water and suggesting a remedy in the restoration of the water to its normal condition by the addition of lime salts or an admixture of some other water containing abundance of these; in complete accordance with all I have been contending for. Schloesing states that Magnesia salts are about equally efficacious with Lime salts, and that salts of Potash are required in about five times the quantity that lime salts are, and that soda salts are still less active. He refers to no other classes of salts, but speaks of Carbonic acid as producing the same effect. attributing its efficacy to the solution of Carbonate of Lime present in the insoluble state.

This idea had occurred to myself, and that also it might explain the

action of the other stronger acids. I am not prepared at present either to admit or deny this. To settle the point would require experiments to be made in which the sources or causes of doubt should be removed. Though it might be supposed that these acids dissolve a small quantity of the otherwise insoluble carbonate of lime, this does not account satisfactorily for the circumstance that the salts of the sesquioxides of aluminum and iron and even of the protoxides of the heavy metals are so much more efficient than lime salts themselves.

I found in another number of the Chemical News, that of 14th May, 1869, an abstract of a "Report of the Netherlands Committee." This committee, evidently, (though particulars are not stated), consisted of a body of scientific men examining the waters of certain rivers with a view to their economical use, the Rhine and Maas being particularly mentioned. So far as I can judge from some particulars mentioned, these waters do not appear to be exactly similar to the muddy water of the Hugli. The committee especially recommend Perchloride of Iron for the purification of such turbid waters, along with Carbonate of Soda, and recommend '032 grains Perchloride of Iron for 1 litre which is equal to 1 part for 31,250. I have given it as 1 to 522,000 and without soda. It is obvious that the question of quantity is very important in the application of this artificial method of clarifying muddy water with a view to economy. The great expense, evident in the application of all proportions known before, was one cause that prevented me from giving the subject much attention, as I had adverted to the use of precipitants as far back as 1867, in my paper in this Journal.*

One way and the best of all ways of restoring the proper quantity of Lime salts to such water would be to bring it thoroughly in contact with Carbonate of Lime, provided it contained enough of free Carbonic acid to dissolve a sufficient quantity. But this is very doubtful and not very likely in ordinary waters. Experiment shewed only a small improvement.

Both Skey and Schloesing state that the chief point seems to be that there should be a certain quantity of the precipitating substance in proportion to the water, and that the quantity of clay present does not make much difference, Schloesing remarking even that the limpidity is more perfect when the mud attains a certain proportion, just as I have myself found that the muddy Hugli water settled and cleared better by adding some dry soil to it, this of course from the soluble matters contained in that soil. The general point, however, I had not time to examine, my attention having been given to the Hugli water as it presented itself in nature.

Both Skey and Schloesing also describe the effect produced by the term coagulation, and it seems quite appropriate. The very fine particles coalesce as it were into larger and comparatively flocculent ones.

^{*} Vol. XXXVI, Part II, p. 138.

I was not content with these small experiments but tried the process by clarifying the water first by such small proportions of these precipitants, settling one or two days and then passing through a sand filter, and found it to answer perfectly, the filtration going on easily and rapidly. The apparatus was small, the precipitating vessel holding about 45 gallons, the filter being a Zinc tube of about six inches diameter. There were two filters, one with Palta and one with Magra sand: the Palta sand filtered best as I used as small a quantity as possible of the precipitating substances. I could not try it on a larger scale, as my premises are now no longer on the bank of the river. But there cannot in my opinion be the smallest doubt but that the process would answer admirably on the large scale.

My former experiments, at least in my own judgment, proved that the Hugli water during the rainy season could not be filtered without unusual difficulty, and that arising from a peculiarity in the water which I connected with the peculiar distribution of the rainfall in this country, though I could not then explain the cause:—it was a matter of fact whether it could be explained or not. Plans proposed to overcome this difficulty, supported by experience of water filtration in England, I declared would be useless, because the water was different and English experience therefore not applicable.

One special contrivance, which it was alleged would be effective for the purpose, I had tried, and had given my opinion that it was worthless for the purpose. The best plan for filtering the water of the rainy season as it presents itself in nature, I concluded, would be by the use of the Palta sand, properly managed, which includes a proper relation between the amount of filtering surface and the quantity of water to be filtered. All of these statements and opinions I still adhere to, as they were conclusions drawn from the observation of facts, the highest and only true authority from which scientific conclusions can be drawn.

A new idea has supplied me with the means of explaining the nature of the peculiarity, and that not by superseding but by confirming the correctness of my previous conclusions that it was connected with the tropical rainfall, and that was by producing extreme dilution of the water. It also indicated a way to remedy the difficulty of settling and filtering the water. The evidence has been given in the preceding pages, and is founded also on the authority of experimental facts open to scrutiny and criticism. The conclusions, it appears to me, may be of value not only with reference to the Calcutta water supply, but to the purification of water in cases where the circumstances are similar, occurring more generally in tropical countries, but even occasionally in other localities.

NEW BURMESE PLANTS, PART III.—By S. KURZ, Esq.

[Received Dec. 5th.]

[With Plates XVIII & XIX.]

CAPPARIDEÆ.

227. CAPPARIS CRASSIFOLIA, nov. sp.

Frutex scandens, spinis brevibus recurvatis armatus, novellis et foliis junioribus subtus tomento minuto canescente obtectis; folia obovalia ad obovata, petiolo ½—½ poll. dum juvenili canescenti-puberulo suffulta, basi magis minusve acuta, apice rotundata et brevissime recurvato-acuta, coriacea c. 2 pollicaria, glabra, nervis crassis subtus conspicuis et præsertim basin versus egredientibus; flores solitarii, iis *C. horridæ* subconformes, pedicello ½ ad ½ poll. canescenti-tomentoso suffulti; sepala et petala ferrugineo-lanata; filamenta numerosa, glabra; gynophorum longum et ovarium globosum glabra.—Prome.—*C. horridæ* arcte affinis.

228. CAPPARIS POLYMORPHA, nov. sp.

Frutex scandens, glauco-viridis, ramis ramulisque tenuiter albescentifarinoso-tomentosis, spinis brevibus curvis puberulis armatus; folia (juniora valde elongato-rhomboidea) rhomboideo-ovata ad obovato-rhomboidea, petiolo ', poll. albescenti-puberulo suffulta, basi obtusa, subcoriacea, obtusa, glauca, subtus et dum juvenilia utrinque, fugaci-albo-puberula, nervis crassis et praesertim basin versus egredientibus; flores solitarii, axillares, iis C. horridæ simillimi, pedicello ½—¾ poll. canescenti- et pro parte ferrugineo-tomentoso crasso suffulti; sepala et petala ferrugineo-lanata; filamenta nunerosa, glabra; gynophorum gracile, glabrum; ovarium glabrum; baccæ (immaturæ) cerasi magnitudine, oblongæ, koves, polyspermæ.—Prome.—Ex affinitate C. horridæ. C. horrida, crassifolia et polymorphæ, species inter se valde affines, habitu longe distant et sacpius in eqdem solo sociatim crescunt.

MALVACEÆ.

229. DECASCHISTIA CRASSIUSCULA, nov. sp.

Frutex humilis, ramosus, dense albido-tomentosus; folia ovata, in petiolo crasso 2—3 lin. tantum longo decurrentia, 2—3 poll. longa, integra v. sublobata, grosse v. obsolete dentata, utrinque dense, subtus albotomentosa; flores sessiles v. subsessiles, 2 poll. fere longi; involucri phylla dense tomentosa, basi bractea longa subulata sustenta; calycis lobi paulum longiores et latiores, tomentosi, crasso-costati; petala stellato-pubescentia, venosa; capsulæ dense tomentosæ.—Prome.—D. crotonifoliæ valde affinis, sed differt floribus sessilibus v. subsessilibus, foliis latioribus decurrentibus et petiolo brevissimo.

STERCULIACEÆ.

230 STERCULIA ORNATA, Wall ap. Voigt. Cat. Hort. Calc. 105.

Arbor decidua, novellis pilis coccineis (in sicco brunneis) sæpius glutinosis tomentosis; liber et lignum album (nec rubrum uti in St. villosa); folia lata, 5—7-loba, lobis acuminatis, subtus dense stellato-pubescentia, supra pilis brevibus fasciculatis minutis aspersa; flores majusculi, pedicello 1—1 poll. longo suffulti, plerumque ochracci in fundo rubicundi, in paniculas terminales coccineo-tomentosas dispositi; calyx puberulus, semilineam longus, lobis lanceolatis patentibus; gynophorum stellato-tomentosum; ovaria fl. fem. dense hispido-tomentosa; carpella 5—6, setis fragilibus lineam fere longis urentibus dense vestita et glabrescentia, c. 21—3 poll. longa, subcylindrico-lanceolata, incurvato-acuminata, intus dense fulvo-setosa; semina pluria, oblonga, atra, lævia.—Pegu, Martaban, Tenasserim.—St. villosæ affinis, inter alia indumento carpellorum et floribus jam distincta.

MALPIGHIACEÆ.

231. HIPTAGE ARBOREA, n. sp.

Arbor parva, decidua, 15—20-pedalis, novellis dense albido v. flavidotomentosis; folia valde variabilia, oblonga et ovato-oblonga ad elliptica et elliptico-lanceolata, 2—3½ poll. longa, petiolo brevissimo crasso, basi obtusa v. rotundata, subcoriacea, dum juniora dense albido-tomentosa et acuta v. breviter acuminata, dein subfloecosa et apiculata v rotundata, nervis subtus valde prominentibus; flores lilacini v. albi, in fundo aurei, pedicello medio 1—2-bracteolato longo albido-pubescente basi bracteato suffulti, racemos breviores v. longiores albido-pubescentes axillares formantes; sepala obtusa v. acuta, lanato-pubescentia, 2—3 lin. longa; petala unguiculata, finibriata, reflexa; carpella magis minusve fulvo-tomentella, glabrescentia, alis plerumque securiformi-emarginatis valde inaequalibus (terminali erecta 1½—2 poll. longa, lateralibus patentibus plus quam 2/3 brevioribus), costa centrali obsoleta.—Prome, Martaban.—Inter species Hiptagis generis extricatu difficillimas haec statura erecta (non scandente) et cortice crassa subcroso-fissa praestat.

RUTACEÆ.

GONOCITRUS, nov. g., Pl. XVIII.

Flores 5-meri (an semper?). StaminaOvarium 3—5-gonum, 3—5-loculare, loculis 2-ovulatis. Bacca coriacea, epulposa, 3—4 angulata. Semina magna, cotyledones carnosæ. Arbuscula spinoso-armata in solo salino rhizophoretorum vigens, foliis simplicibus alternis. Flores solitarii, axillares. Genus distinctissimum sed incomplete cognitum, Atalantia affine.

232. G. ANGULATUS (Citrus angulatus, Willd. sp. pl. III. 1426; Rumph. Herb. Amb. 110, t. 32; Dc. Prod. I. 540; Atalantia longispina

Kurz in Journ. As. Soc. Bengal, 1872 295). Baccæ epulposæ, sed intus succo viscido parco (oleo condensato ?) vestitæ. Flores albidi (ex Rumph.).

LEGUMINOSÆ,

233. CROTALARIA KURZII, Baker MS.

Herba annua, erecta, ramosa, 1-3-pedalis, ramis teretibus parce appresse pubescentibus; folia obovato- ad lato-lanceolata, basi subcuneata. brevissime (1-2 lin.) petiolata, mucronato-acuta v. subcuspidata, $1\frac{1}{4}-3$ poll. longa, raro longiora, subtus parce puberula et pallida; flores mediocres, lutei, vexillo extus atropurpureo-striato, pedicello 4-4 poll, pubescente suffulti, vulgo solitarii v. raro bini, hine inde fasciculatim ex foliorum axillis erumpentes simulque in racemos axillares et terminales parce pubescentes dispositi; bractee minuto, subulate; calyx semilineam circiter longus, parce appresse puberulus, lobis falcato-lanceolatis acuminatis; corolla calyce longior; legumen 1 ad 11 poll. longum, sessile, basi attenuatum, glabrum; semina pallida v. pallide brunnea, nitentia, lin lata. Var. a. genuina, folia minora, 4 poll. non excedentia; legumen 4-1 poll. tantum longum et calyce duplo longius; semina pallida, lineam lata.—Pegu, Martaban.—Var. B. luxurians, folia 6 poll. longa; legumen 12-2 poll. longum et calyce 3-4 plo longius; semina brunnea, 21 lin. circiter lata. Pegu. cujus flores non vidi, cum forma typica, characteribus supra indicatis exceptis, omnino quadrat.

234. Indigofera caloneura, nov sp.

Frutex erectus, ramo-us, fulvo-puberulus; stipulæ c. 2 lin. longæ, lineari-subulatæ, dense pubescentes; folia 1-toliolata, petiolo 3—4 lin. longo crasso dense fulvo-pubescente suffulta; foliolum ellipticum, utrinque rotundatum v. scepius apice retusum, mucronulatum, 3—4 lin. longum, chartaceum, supra glabrum, subtus molli-pubescens et glaucescens, costa nervis venisque valde prominentibus et fulvo-pubescentibus; flores rosei?, parviusculi, pedicello 2 lin. longo filiformi puberulo suffulti et racemum robustum pubescentem axillarem foliis vulgo breviorem formantes; bracteæ longiusculæ, subulatæ; calvx brevis sed amplus; lineam vix altus, dentibus 3-angularibus acutis; corolla c. \(\frac{1}{2}\) poll. longa; ovarium dense sericeopubescens; legumen deest.—Pegu.—Ex affinitate J. Brunonianæ, Grah.

235. DESMODIUM OBCORDATUM (Uraria obcordata, Miq. Suppl. Fl. Sumatr. 114 et 305).

Herba perennis, volubilis, 3—4-pedalis, puberulus; stipulæ lanceolatæ, acuminatæ, pubescentes, c. 3 lin. longæ; folia pinnatim 3-foliolata, petiolo ½—1 pollicari puberulo; foliola lateralia minora, deltoidea, retusa et mucronato-apigulata, foliolum terminale transverse obcordato-lunatum, ½—2 poll. latum, in sinu mucronatum, chærtaceum, supra tenuissime subtus parce pilosum et pallidum, venis transversis prominentibus; flores parvi, cyaneo-

purpurei, pedicello gracili 2—8 lin. longo pubescente, in racemum gracilem pubescentem axillarem sæpius in paniculam terminalem abountem dispositi; bracteæ lineares, subulato-acuminatæ, 2—8 lin. longæ, pubescentes, caducissimæ; calyx pubescens, lineam circiter longus, lobis lanceolatis acuminatis; corolla 2½ lin. longa; legumen in stipitem 1 lin. longum attenuatum, recurvatum, planum, chartaceum, puberulum, moniliformi-2—3, v. sæpius 1-articulatum; articuli hastato-rotundati, c. ½ poll. longi et lati; semina reniformi-oblonga, compressa, brunnea, nitentia.—Tenasserim.—Ex affinitate D. strangulati, &c.

236. DESMODIUM OBLATUM, Baker MS. (Desmodium reniforme, Wall. Cat. vix Dc. certissime non Burm).

Fruticulus erectus, gracilis, 2—3-pedalis, glaber; stipulæ et stipellæ minutæ; folia 1-foliolata, petiolo capillari $\frac{1}{3}$ — $\frac{1}{3}$ pollicari suffulta; foliolum transverse ellipticum, apice subsinuatum v. rotundatum, 1—1 $\frac{1}{3}$ poll. latum, integrum, glabrum, læte virens; flores parviusculi, cyanei, pedicello capillari c. $\frac{1}{3}$ pollicari puberulo, fasciculati et racemum gracillimum puberulum axillarem in paniculam terminalem abeuntem formantes; bractæ persistentes, ovatæ; calyx c. $1\frac{1}{2}$ lin. longus, subglaber, lobis lineari-lanceolatis acuminatis; corolla sub—3 lin. longa; legumina in stipitem brevissimum contracta, compressa, minute puberula et glabrescentia, lineari-oblouga, moniliformia, 2—4 passim 1-articulata, articuli semiorbiculares, suturâ exterioro vix curvà, reticulati, c. 2 lin. longi v. longiores; semina compressa reniformia pallide brunnea nitentia.—Ava, Pegu, Martaban.—Ex affinitate D. reniformis, &c.

237. DESMODIUM AURICOMUM, Grah. in Wall. Cat. 5704.

Herba annua a basi ramosa patenter fulvo-pilosa; stipulæ lanceolatæ, aristato-acuminatæ, striatæ, 2—2½ lin. longæ; folia pinnatim 3-foliolata, petiolo parce piloso 3—4 lineari suffulta; foliola elliptica ad obovalia, rotundata v. subretusa, ½—3 poll. longa, supra subglabra, subtus parce appresse pilosa; flores parvi purpurei, pedicello capillari piloso ½—3 pollicari, racenum gracilem patenti fulvo-pilosum terminalem v. ramulos axillares terminantem formantes; bractæ vulgo sub anthesi persistentes, ovatæ, subulato-acuminatæ, 3—4 lin. longæ, fulvo-pilosæ; calyx 1½ lin. longus, fulvo-pilosus, lobis linearibus subulatis; corolla æquilonga v. paulo longior; legumina plana, sessilia, lineari-oblonga, ciliata et intra marginem villoso-pilosa, laxe reticulata, 3—5-articulata, articuli lin. circiter longi et lati, suturà interiori rotundati exteriori subrecti, dehiscentes; semina reniformia, brunnea, nitentia.—Arracan, Tenasserim.—Ex affinitate D. trifori, &c.

238. LESPEDEZA PINETORUM, nov. sp.

Frutex subsimplex v. ramosus robustus erectus 2—4-pedajis dense fulvescenti-pubescens; folia 8-foliolata, petiolo \(\frac{1}{2}\)—\(\frac{1}{2}\) pollicari villoso suffulta; foliola elliptica ad elliptico-ovata, brevissime crasseque petiolata, 1—2

poll. longa, obtusa v. acuta cum mucrone, integra, coriacea, supra subrugosa et parce subtus dense fulvescenti- v. subcanescenti-villosa et prominenter nervosa; flores parviusculi, cyanei v. rosei, pedicello lin. longo gracili pubescente suffulti in racemos villoso-pubescentes robustos sed breviusculos axillares v. terminales dispositi et sæpius paniculam densam terminalem efformantes; calyx c. 2½ lin. longus, fulvescenti-villosus, lobis subulatis; corolla 3½ lin. longa, glabra; legumen dimidiato-ovatum, 3 lin. longum, sericeo-pubescens.—Martaban.—L. hirtæ, Miq. quodammodo affinis.

239. LESPEDEZA DECORA, nov. sp.

Frutex erectus, 3—5-pedalis, caulibus angularibus appresse fulvo-pubescentibus dein canescentibus; stipulæ c. 3 lin. longæ, rigidæ, lineari-subulatæ; folia pinnatim 3-foliolata, petiolo gracili 1—1½ pollicari canescente suffulta; foliola breviter petiolulata, obovalia ad elliptica, apice rotundata mucronata, chartacca, 1—1½ poll. longa, supra atroviridia, glabra, subtus glaucescentia et sub lente appresse pubescentia; flores cærulci, pedicello gracili c.½ pollicari glanduloso-pubescente instructi, racemos brevesat graciles fulvo-glanduloso-pubescente persistenter bracteatos sæpius in paniculam brevem collectos efficientes; bracteæ ovato-lanceolatæ, subulato-acuminatæ, c. lin. longæ, glanduloso-puberulæ; calyx c. 3 lin. longæ, fulvo-pubescens, lobis ovatis acuminatis; corolla ½ poll. longæ; legumina (immatura) oblique ovato-lanceolatæ, acumiuata, compressa, breviter sericea.—Martaban.—Hic Desmodium angulatum, Wall. Cat. 5729, I. quoad specimina sterilia probabiliter e Taong-dong sumpta.

240. LESPEDEZA PARVIFLORA, nov. sp.

Frutex, ramulis angularibus sericeo-puberulis; stipulæ rigidæ, linearisubulātæ, c. 2—2½ lin. longæ; folia pinnatim 3-foliolata, petiolo gracili canescente ½ poll. longo suffulta; foliola breviter petiolulata, elliptica ad elliptico-ovata, ½—1 poll. longa, chartacea, supra glabra et atroviridia, subtus glaucescentia et appresse puberula; flores cyanci?, parvi, pedicello ½—1 lin. longo fulvo-pubescenti instructi et in racemos axillares strictos fulvo-pubescentes folio circiter duplo longiores apice ramorum sæpius congregatos dispositi; bractææ deciduæ; calyx dense fulvo-pubescens, c. 2 lin. longus lobis subulatis; corolla 3½ lin. circiter longa; legumina (immatura) oblique ovata, acuminata, sericea.—Martaban (Rev. F. Mason).—L. ellipticæ, Bth affinis, a qua differt: floribus multo minoribus, calycis lobis subulatis, bracteis deciduis et indumento.

241. MUCUNA BRACTEATA, Dc. (Carpopogon bracteatus, Roxb. MS. Jc, XX. t. 138).

Herba perennis, volubilis, novellis parce appresse pubescentibus; stipulæ...; folia pinnatim 3-foliolata, petiolo glabro v. subglabro 2—4 pollicari suffulta; foliola ovata v. subovata (lateralibus valde obliquis, terminali magis trapezoideo), petiolulo brevi pubescenti suffulta, obtusiuscule apiculata v. cuspidata, mucronata, chartacea, supra glabra, subtus puberula v. sub lente appresse pubera; flores magni, atropurpurei, pedicello canescenti-puberulo c. 2 lin. longo suffulti, 2—3-ni v. solitarii pedunculum secundarium 2—3 lin. longum terminantes et in racemum bracteato-pedunculatum axillarem nutantem canescenti- v. fulvescenti-pubescentem dispositi; bracteæ ovatæ ad lanceolatae, subulato-acuminatæ, velutinæ, florales valde deciduæ, inferiores vacuæ pedunculum vestientes persistentes, majores, ½—¾ poll. longæ; bracteolæ paulo minores, rotundatæ, deciduæ; calyx amplus, c. 4—5 lin. in diametro, dense canescenti-puberulus et setis fragilibus fulvescentibus aspersus; corolla c. 1¾ poll. longa, alæ subduplo, carina vexillo subtriplo longiores; legumina oblonga v. suboblonga, compressa, 1—2½ poll. longa, carinis longitudinalibus secus suturam superiorem destituta densissime urenti-setosa, 2—5 sperma; semina transverse oblonga, vulgo brunneo et atromaculata.—Pegu, Martaban, Ava.—Species distinctissima, M. prurienti affinis.

242. GRONA FILICAULIS, nov. sp.

Volubilis, tenera; folia lato cordato-ovata, petiolo pubescente \(\frac{1}{2}\)—\(\frac{3}{2}\) pollicari suffulta, obtusa, mucronata, 1—1\(\frac{1}{2}\) poll. lata, utrinque sparse hirsuta, palmati nervia; flores parvi, flavi, pedicellati, cirrhoso-pedunculati, axillares; legumina tenera, glaberrima, lincaria, poll. circiter longa, 5—6-sperma; semina nitentia, olivacea, nigro-maculata.—Pegu.—G. Grahamii, Bth. affinis.

243. PUERARIA BRACHYCARPA, nov. sp.

A. P. ferruginea (Amphicarpea ferruginea, Bth. in Pl. Jungh. I.) differt: omnibus partibus glabrior, leguminibus torosis appresse pubescentibus sub-glabrescentibus pollicem vix excedentibus 3 lin. fere latis 5—6-spermis.—Pegu.

ROSACEÆ.

Pyrus Karensium Kurz, in Jouin. A. S. Bengal, 1872, 306, cadem est ac P. granulosa, Bertoloni Piante nuove Asiatiche 10, t. 3, (sub nom. P. granulatæ) in memorie dell' Accademia d. scienze dell' istituto di Bologna, Ser. II, Vol. IV. 1864-65. Planta Khasyana el. Bertolonii valde est serratifolia, sed formæ intermediæ etiam in Herbario Horti Calcuttensis adsunt. Species fere omnes Indicae a cl. Hookero et Thomsonio collectæ et in opusculo hic citato descriptæ et iconibus illustratæ inapte propositæ sunt.

MYRTACEÆ.

244. Eugenia Pachyphylla, nov. sp.

Arbor glabra, ramulis albis; folia obovata ad obovato-oblonga, basi magis minusve cuneato-acuminata, petiolo crasso 3—4 lin. longo suffulta, obtusiuscula v. obtusiuscule apiculata, 3—4 poll. longa, crasse coriacea, glabra, in sicco fuscescentia, nervis lateralibus tenuibus et prominentibus

satis distantibus et subirregulari-parallelis; flores mediocres, vulgo solitarii v. terni, sessiles paniculam brevissimam crassam trichotomam terminalem efformantes, pedunculo et ramis brevissimis $(\frac{1}{4}-\frac{1}{2}$ poll.) crassimiss 4-gonis articuliformibus; calyx c. 4 lin. longus, obconicus, basi attenuatus, lævis, limbo 4-lobo, lobis rotundatis c. 2 lin. longis persistentibus; petala, etc. desunt.—Tenasserim (Dr Brandis).—Ex affinitate E, grandis.

245. EUGENIA CERASIFLORA, nov. sp.

Arbor magna, 90-100 pedalis, glabra, ramulis albidis compressiusculis; folia magis minusve lato-lanceolata, basi acuta v. acuminata, petiolo \$\frac{1}{8}\$—\$\frac{3}{8}\$ poll. longo, obtusiuscule acuminata v. passim obtuse apiculata, \$\frac{4}{2}\$—7 poll. longa, pergamacea, glabra, opaca, subtus pallida, nervis lateralibus sat irregulari-parallelis et sopius curvis tenuibus sed prominentibus; flores parviusculi, albi, pedicello gracili 2—4 lin. longo suffulti, in racemum brevem gracilem glabrum axillarem v. supra foliorum delapsorum cicatricibus orientem collecti; calyx 3\frac{1}{2}\$—5 lin. longus, ejus pars superior ampliatus c. 3 lin. longa, clavato-turbinatus, lævis. limbo persistente 4-lobo, lobis semiorbicularibus 2 lin. fere longis, pars inferior pedicelliformi-contracta gracilis \frac{1}{2}\$—2 lin. longa; petala c. \frac{1}{3}\$ poll. longa, concavo-orbicularia, libera; filamenta longa, gracilia; bacca globosæ v. didymo-globosæ, pisi magnitudinis, in stipitem longum gracilem protractio, 1—2 spermæ, læves, calycis limbo disciformi patente coronatæ.—Martaban (Etiam in montibus Sikkim Himalaya, Khasya, etc. Species juxta E. lanceæfoliam inserenda.

246. EUGENIA TRISTIS, nov. sp.

Arbor glabra, ramulis teretibus crassis pallide brunneis; folia elliptica ad elliptico-obovata, basi acuta, petiolo ½—½ poll. longo crasso, obtuse-apiculata, coriacea, 4--5 poll. longa, glabra, opaca, nervis lateralibus subdistantibus et sat irregularibus crassiusculis et prominentibus; flores....; panicula fructicans corymbiformis, sessilis, terminalis, glabra, ramificationis brevibus et robustis; bacero pedunculo crasso 1—2 lin. longo suffultæ, depresso-globosæ, cerasi magnitudinis, glabræ, calysis limbo discoideo patenter 4-lobo coronatæ, 2 v. 1 spermæ, endocarpio tenui carnoso; calyçis lobi sub fructu c. 1½ lin. longi, rotundata.—Tenasserim. Ex affinitate E. grandis, sed foliorum indole longe distat.

247. BARRINGTONIA AUGUSTA (Stravadium augustum, Wall. Cat. 2637 pp.)

Arbor mediocris glabra; folia cuneato-oblonga ad obovato-cuneata, basi attenuata obtusa v. acuta, petiolo crasso 3—4 lin. longo, acuta v. subacuncata, ½—1½ ped. longa, sursum crenulato-serrata, chartacea, glabra; flores conspicui, sessiles, in spicam longissimam fulvo-pulverulentam terminalem dispositi; rachis crassa basi foliis numerosis reductis lanceolatis cineta; calyx velutinus, tubo c. lin. longo v. longiore alatim 4-gono, kobis rotundatis c. 2 lin. longis; petala...; bacce (immaturæ) fibroso-carnoses,

oblongæ, fulvo-pulverulentæ, calycis limbo coronatæ, 4-alatæ, alis carnosis et crassis angustis undulatis.—Tenasserim.

248. Barringtonia pterocarpa, nov. sp.

Arbor mediocris, 30—50-pedalis, glabra; folia elongato-obovato-lanceolata, basi cuneato-acuminata in petiolum breviorem v. longiorem (usque ½ poll. longum) decurrentia, breviter acuminata. 1—1½ ped. longa, apicem versus crenulato-serrata, pergamacea, glabra; flores conspicui, albisv. rosci (filamentis albis), sessiles, spicam longissimam robustam pulverulentam terminalem efficientes, rachis crassa basi foliis floralibus reductis numerosis lanceolatis cineta; calyx velutinus, tubo lineam circiter longo alatim 4-angulato, limbo 4-fido, lobis triangulari-ovatis acutis v. obtusiusculis plus quam 3 lin. longis; petala ¾ poll. longa, ovato-oblonga, acuta; bacceo oblonge, fibroso-carnosco, c. 2 poll. longa, 4-gonæ, angulis anguste et crasse alatis.—Pegu, Martaban.—B. augustæ valde affinis sed differt foliis longe decurrentibus et calycis lobis.

LYTHRARIEÆ.

249. LAGERSTREMIA MACROCARPA, Wall. Cat. 2114; Voigt. Hort. Calc. 132.

Arbor parva v. mediocris 30—40-pedalis decidua, glabra; folia oblonga ad ovato-oblonga, breviter petiolata, vulgo larga præsertim juniora usque 1½ ped. longa, adulta 5—6—9 poll. longa, basi obtusa v. rotundata, chartacca, obtusa, obtusiuscule apiculata v. passim acuminata, integra, glabra; flores magni, 3—4 poll. in diametro, speciosi, violacei v. violaceo-purpurei, pedicello crassiusculo canescenti-pulverulento suffulti, solitarii v. 2-ni—3-ni cymosi et in paniculam depauperatam terminalem breviusculam collecti; calycis alabastrum oblongo-turbinatum, canescenti-velutinum, tenui-sulcatum nec costatum, lobis lanceolatis acutis secus margines haud incrassatis; petala 1—1½ poll. longa, lato-elliptica v. suborbicularia, unguiculata, crispato-undulata; stamina æquilonga; capsulæ lignosæ, 1—1½ poll. longæ, oblongæ mucronatæ; semina L. Flos reginæ, sed majora.—Birmania tota.—L. Flos reginæ valde affinis.

250. LAGERSTRUMIA VILLOSA, Wall. MS. in H. B. C.

Arbor magna, 80—90-pedalis, in locis siccioribus 40—50-pedalis, ramulis, &c. dense puberulis; folia ovata ad ovato-oblonga, petiolo brevissimo pubescente suffulta, basi rotundata, chartacea, magis minusve acuminata 2—4 poll. longa, supra minute velutina, subtus subcanescenti-pubescentia v. puberula; flores parvi, albidi, pedicello gracili pubescente, in cymas pedunculatas dispositi et paniculam terminalem contractam molliter puberulam efformantes; calyx in alabastro turbinatus, dense granescenti-puberulus, 4—5—6-lobus, lobis triangularibus acutis tubum 4—6-costatum longitudine fere sequantibus, costis subaliformibus; petala minuta, calycis

dentes haud superantia, cuneato-lanccolata, acuta, alba; antheræ purpureæ; capsulæ oblongæ, semipollicem circiter longæ, mucronulatæ, valvatim 4—6-loculares.—Pegu, Martaban.

GENTIANEÆ.

251. GENTIANA NUDICAULIS, nov. sp.

Herba erecta annua glabra cauli tereti nudo 1—2 pollicari; folia apice rosulata, lineari-lanceolata ad linearia, basi subattenuata sessilia acuta v. acuminata, usque ad 1½ poll. longa, coriacea, 3-nervia (nervis supra impressis); flores cyanei, raro pallide coerulei, depauperato-cymosi et foliosopedunculati v. (in spp. Burmanicis) in glomeros densos axillares et terminales congregati; calyx ½ poll. longus, infundibuliformis, plicato-5-angulatus, usque ad medium 5-lobus, lobis lineari-subulatis albo-marginatis; corolla semipollicaris v. paulum longior, plicato-5-loba, lobis acutis v. acuminatis; stamina corollam longitudine subsequantes; filamenta stricta, sub medio corollae tubi inserta; ovarium lineare, in stipitem brevem attenuatum; capsula clavata, crasse et breviter stipitata, a medio ala sursum latissima cineta stylis 2 revolutis coronata; semina minuta, exalata, oblonga. Var. a. genuina, ramuli evoluti et florentes paniculam spuriam efformantes; var. β. compacta, ramuli suppressi indeque flores compacto-glomerati.—var. α. montes Assamico (Griff. No. 5819); var. β. Martaban.

252. GENTIANA CRASSA, nov. sp.

Suffrutex ramosus deorsum defoliatus; folia lanceolata ad obovato-lanceolata, basi attenuata et cum folio opposito in vaginam brevem connata, inferiora 1;—2 pollicaria, coriacea, obtusiuscule acuminata, 3-nervia, secus margines subrevolutos subcrenulata: flores majusculi, sessiles et glomerati et cymam terminalem majorem v. minorem foliatam compactam formantes; calyx fere 3 poll. longus, tubuloso-campanulatus, teres, profunde 5-lobus, lobis valde inacqualibus, quorum 3 minimis lineari-lanceolatis o basi truncata abrupte emissis, eceteris 2 subfoliaceis tubi fere longitudinis oblongis acuminatis basi attenuatis 1-nerviis; corolla pollicaris, infundibuliformi-campanulatus, plicato-5-lobus, lobis lato-ovatis, abrupte acuminatis; stamina corolla breviora, filamentis basin versus sensim latioribus tubo basin versus insertis; ovarium lineari-lanceolatum, in stipitem crassum attenuatum; capsula compresso-lanceolata, acuminata, e corollâ marcescente semi-exserta, stipite plusquam i poll. longo suffulta, valvis stylo brevi revoluto terminatis.—
Martaban.

PHYLLOCYCLUS, nov. g.

Calyx campanulatus, inflatus teres. Corolla subregularis, lobis imbricatis, basi sapius bimaculatis. Stamina 4, 2 inferiora longiora fertilia exserta polline miniato scatentia, 2 superiora subinclusa filamentis brevibus suffulta effecta. Ovarium 1-loculare, ovulis numerosis placente bifida parie-

tali insertis; stylus deciduus; stigma bilobum. Capsula 1-locularis, septicide bivalvis. Semina plurima, placentis spongiosis immersa, minuta. Herbæ annuæ facie Cyclophylli generis Canscora, sed foliis omnibus perfoliatis caulibus teretibus et floribus vulgo solitariis axillaribus. Genus Canscora inter alia differt: corollæ lobi 2 inferiores approximati a medio tali modo replicati ut plicis arcte approximatis quasi lobum singulum mentient indeque corollam prima facie 3-lobam immitent; stamina 4, quorum unum tantum fertile et multo longius in plica loborum inferiorum receptum, cætera multo minora effæta sunt.

253. PH. HELFERIANA, (Canscora Helferiana, Wall. MS.).

Herba annua dichotomo-ramosa glabra 1—2-pedalis; folia perfoliata, orbicularia, ½—1 poll. lata, radiato-venosa, membranacea; flores parvi, albidi, pedicello brevissimo gracili suffulti, solitarii, axillares; calyx lævis, teres, campanulatus, c. 3 lin. longus, lato-4-dentatus; corollæ tubus calycis longitudine, inflatus, limbo parvo 4-lobo, lobis oblongis obtusiusculis; capsula.........—Tenasserim (Helf. 5816).

Altera species hujus generis, C. Parishii, Hook. Bot. Mag. t. 5429, facile distinguitur floribus duplo majoribus, lobis multo latioribus, etc.

PEDALINEÆ.

254. Brandisia discolor, Hf. et Th.

Capsula ovalis, compressiuscula, semipollicem fere longa, calyce subduplo longior, fulvo-tomentosa, mucronata, semina linearia, 2 lin. longa.— Wightiae, Wall., arcte affinis. Etiam Buddleiæ generi affinis, sed differt corolla irregulari, etc. et certissime inter Sesameas recipienda est. Gardneria, a cl. Benthamio Loganiaceis adnumerata, Solanea esse videtur.

EUPHORBIACEÆ.

255. ACTEPHILA PUBERULA, nov. sp.

Frutex 4—8-pedalis, novellis minute puberulis; stipulæ ovatæ, breves valde deciduæ; folia elliptico- v. obovato-oblonga, basi rotundata v. subcordata, petiolo \(\frac{1}{3}\)—1\(\frac{1}{2}\) pollicari puberulo glabrescente suffulta, 4—7 poll. longa, obtusiuscule acuminata, integra, crasse membranacea v. chartacea, supra glabra, subtus secus nervos puberula et glabrescentia, in sicco flavescentiviridia; flores aurantiaci, monoici v. dioici, solitarii, axillares; calyx coriaceus; capsula cerasi magnitudine, granulato-rugulosa, pedunculo sursum incrassato \(\frac{1}{2}\)—2 pollicari glabro suffulta.—Andamans (etiam in insulis Nicobaricis).—Actophila habitu et characteribus generi Trigonostemoni valde accedit sed ovulorum numero distinguitur. Tylosepalum aurantiacum, Kurz, quod cl. Muell. Arg. ad Codiæum duxit, ad genus Trigonostenson repellendum est ubi in sect. VI. Eutrigonostemone inserendum (cf. Teysm. et Binnend. Cat. pl. hort. Bogor 1868, p. 223).—

256. Antidesma fruticulosum, nov. sp.

Fruticulus 2—4-pedalis ramosus pubescens; stipulæ lineares, acuminatæ, fulvo-pubescentes, petiolo longiores, 2—3 lin. longæ; folia parva, elliptico- ad obovato-lanceolata, petiolo crasso c. lin. longo fulvo-pubescente, basi attenuatå rotundata v. obtusa, 1—2½ poll. longa, breviter et obtusiuscule acuminata cum mucrone, passim obtusa v. retusa, membranacea, supra sparse hirsuta subtus imprimis secus nervos adpresse pubescentia; flores minuti, sessiles, in spicas breves sat robustas fulvo-tomentosas simplices v. raro compositas vulgo e ramulis reductis ortas collecti; bracteæ ovato-lanceolatæ, pilosæ, minutæ; calyx extus tomentosus, 4-partitus, lobis rotundatis subacutis; discus subglaber; stamina 2 v. 3, antheris didymis; stylus terminalis, simplex; drupæ rubræ dein atropurpureæ, suboblique ovoideæ, læves, 2—2½ lin. longæ, putamine compresso subrugoso.—Pegu.—A. Roxburghii, Wall. valde affinis, sed omnibus partibus minor.—N. B. A. molle, Mull. Arg. synonymon est A. velutinosi, Bl.; bracteæ dum juveniles obovatæ, dein sub anthesi lineari-lanceolatæ.

GLOCHIDION, FORST.

Genus distinctissimum, a cl. Muell. Arg. cum *Phyllanthi* genere inapte conjunctum, structura florum femineorum et etiam (uti jam beat. Roxburghius docuit) arillo (spurio) facile distinguitur. In sicco hie arillus spurius v. potius tegumentum exterius seminis utplurimum pulchre miniatus v. coccineus succosus more Euphorbiacearum aliarum (e. g. *Claoxylon* etc.) membraniformis indeque ab auctoribus plurimis omnino prætervisus erat. Omnes species a cl. Muell. Arg. in Dc. Prod. vol. XV. et a cl. Benthamio in Flora Austr. vol. VI. sub *Eu.*- et *Hemi-glochidione* publicatæ iterum ad genus *Glochidii* reducendæ sunt.

257. GLOCHIDION DASYSTYLUM, nov. sp.

Àrbuscula v. frutex 15—20-pedalis, pubescens, ramulis subteretibus fulvo- v. ferrugineo-hirsutis; folia ovata, subobliqua, petiolo 1 lin. longo tomentosa, acuminata, basi rotundata v. obtusa, 2—3 poll. longa, chartacea, molliter pubescentia, adulta supra minute puberula; flores desunt, feminei fasciculati v. subumbellati; capsulæ pedicello gracillimo usque ad † poll. longo piloso suffultæ, depresso-globosæ, c. † poll. in diametro, 3-loculares et 6-lobulatæ, patenter albo-pilosæ; columna stylaris brevis, 3-fida, lobis linearibus simplicibus patentibus pubescentibus.—Martaban.—Gynoon hirsutum, Wight Ic. t. 1909 habitum plantæ supra descriptæ optime representat sed certissime specifice distinctum est.

258. GLOCHIDION LEIOSTYLUM, nov. sp.

Frutex magnus v. arbuscula, ramulis subangulatis novellisque pubescentibus; folia oblique ovata ad oblongo-ovata, petiolo lin. longo pubescente, basi inæquali acuta v. obtusa, longius v. brevius sæpius obtusiuscule acuminata et mucronata, chartacea, supra costă exceptă glabra, subtus preser-

tim secus nervos puberula; flores minuti, masculi pedicello longo gracili pubescente, feminei sessiles v. subsessiles, glomerati; maris calyx vulgo 5-fidus, lobis lanceolatis acutis; stamina 3; fem. calyx 5-partitus, parce pubescens, segmentis lineari-lanceolatis acuminatis; oavrium villosum; columna stylaris conica, sursum attenuata et 3-fida, lævissima; capsulæ omnino iis G. dasystyli conformes, depresso-globosæ, c. ½ poll. in diametro, 3-loculares et 6-lobulatæ, pilosulæ, sessiles v. brevissime podunculatæ stylis glabris.—Pegu, Martaban, Tenasserim.—Priori arete affinis.

259. GLOCHIDION ANDAMANICUM, nov. sp. (Phyllanthus Andamanicus, Kurz in And. Rep. ed. 1. p. XVI.)

Arbuscula 25-pedalis glaberrima, ramulis compresso-angulatis; folia elliptica v. elliptico-oblonga, inferiora sæpius minora et suborbiculari-elliptica, basi acuta v. obtusa, petiolo 1;—2; lin. longo suffulta, obtusa v. obtusiusculo acuminata, 2—3 poll. longa, tenui-coriacea, lævia, subtus glaucescentia, flores fem. parvi, sessiles, glomerati, masculi pedicello gracili puberulo suffulti, axillares, fasciculati: calyx maris puberulus, lobis oblongis obtusis; stamina 3; calyx fem. 5-lobus, parce puberulus; ovarium villoso-tomentosum, columna stylaris crasse conica, ovarii crassitudine, truncata, stigmatibus 5—6 tuberculiformibus terminata; capsulæ 6—4-coccæ, depresso-globosæ, utrinque concavæ, canescenti-puberulæ et 12—8-sulcatæ, plus quam; poll. in diametro.—Andamans.—Ex affinitate G. Bancani, Miq. speciei haud cum G. Zeylanico conjungendæ.

CICCA, L.

Sub nomine hocce *Phyllanthi* species epicarpio carnoso a me conjunguntur; structura florum et masculorum et femineorum autem valde diversa est, viz.

Subg. I. EUCICCA (Cicca, L.) Flores tetrameri. Stamina libera 4. Glandulæ in maribus et hermaphroditis liberæ et distinctæ. Capsulæ drupaceæ, magnæ, carnosæ, sæpius 4-coccæ.

Subg. II. Securinega, Muell. Arg. Flores 5-meri. Stamina 5, libera. Discus annulari-5-gonus. Capsula bacciformis, 3- v. abortu 2-cocca, alba, in vivo magis minusve succulenta.

Subg. III. KIRGANELIA, A. Juss. Flores 5—6-meri. Stamina diadelpha, interiora 3 omnino, exteriora basi tantum connata. Glandulæ in fem. distinctæ. Capsulæ bacciformes, 12—6-coccæ, succulentæ, purpureæ v. atropurpureæ.

Subg. IV. EMBLICA, Gærtn. Flores vulgo 6-meri. Stamina in columnam connata. Ovarium 3-loculare. Glandulæ in fem. urceolato-connatæ. Capsulæ drupaceæ, magnæ, aqueo-albæ, putamine capsulari 8-cocco lignoso tarde dehiscente.

260. Cicca (Emblica) albizzioides, nov. sp.

Arbor elegans, 25—30-pedalis, novellis puberulis; folia oblonga, inferiora elliptica v. suborbicularia, subsessilia, basi rotundata, usque ad poll. longa et ½ poll. lata, retusa v. obtusa, chartacea, glabra, subtus glaucescentia; flores minuti, flavescentes, glabri, pedicello glabro gracili suffulti, feminei subsessiles, secus ramulos novellos pubescentes glomerati et racemum interruptum subaphyllum efformantes; calycis lobi obovato-lineares, columna staminalis longiuscula et gracilis; styli 3, basi connati, 2-fidi, lobulis latiusculis integrisque; capsulæ drupaceæ iis C. Emblicæ conformes sed duplo majores, sessiles, in vivo plus quam poll. in diametro, globosæ, aqueo-albi et nervosæ, pericarpio carnoso acidissimo.—Pegu.

261. CICCA (EMBLICA) MACROCARPA, nov. sp.

Arbuscula 20—25-pedalis, habitu C. Emblicæ, sed cortice aspero fisso rugoso insignis, ramulis puberulis; folia anguste linearia, subsessilia, acuta v. obtusiuscula, basi rotundata, coriacea, marginibus subreflexis, \(\frac{1}{2} \rightarrow \frac{3}{2} \) poll. longa, glauco-viridia, glabra; flores lutescentes, pedicellis filiformibus suffulti, secus ramulos novellos breves aphyllos fasciculati et racemum compactiusculum usque poll. longum canescenti-pubescentem efformantes; calyx glaber, 6-partitus, lobis obovato-oblongis; columna staminalis gracilis, styli 3, basi breviter connati, robusti, 2-lobi, lobulis latis et brevibus 3-crenulatis; capsulæ drupaceæ cum iis C. albizzioidis exacte congruunt—Prome, Pegu.—C. Emblicæ arete affinis, sed differt cortice, stylorum lobis et capsulis duplo majoribus.

262. Aporosa villosula, nov. sp.

Arbor sempervirens, 25—30-pedalis, novellis parce pubescentibus mox glabrescentibus; folia oblonga ad elliptico- et obovato-oblonga, basi obtusa v. acuta, petiolo apice incrassato \(\frac{1}{2} - \frac{3}{2} \) glabro suffulta, breviter et obtusiuscule acuminata v. apiculata, integra v. subintegra, 3—5 poll. longa, rigide chartacea v. subcoriacea, glabra, in sicco fuscescentia et nitentia; flores minuti (masculi desunt), feminei sessiles, bracteis latis obtusiusculis glabris ciliolatis dense imbricatis protecti et spicas amentaceas breves usque semipollicem longas binas v. per plures glomeratas axillares v. supra foliorum delapsorum cicatricibus orientes efformantes; ovarium dense fulvo-villosum, stigmatibus lævibus brevibus recurvis breviter bilobis terminatum; baccæ aurantiacæ, ovoideæ, pisi majoris magnitudine, apiculatæ, parce hirsutulæ v. passim subglabræ, 2—1-loculares.—Pegu, Martaban, Tenasserim, Andamans.—A. Roæburghianæ nimis affinis.—N. B. Antidesma lunatum, Miq. = Aporosa lunatum, mihi; hie planta el. Maingay No. 1416 et Wall. Cat. 5975, sub nomine "Cynometra fide Bentham."

263. Hymenogardia plicata, nov. sp. (Coccoceras plicatum, Muell. Arg.?)

Arbor decidua, novellis ferrugineo-puberulis ; folia oblonga et elliptico-ad obovato-oblonga, petiolo poll. longo v. paulum longiore puberulo suffulta, basi 3-nervia rotundata v. subcordata et sæpius subattenuata, breviter et abrupte obtusiuscule acuminata, crenato-repanda, 3-5 poll. longa, chartacea, subtus secus nervos puberula et dense lutescenti- v. rubescenti-glandulosa; flores dioici, masc. pedicello brevissimo puberulo, glomerati, feminei sessiles, in racemos elongatos axillares v. supra foliorum delapsorum cicatricibus egredientes dum juvenilia amentaceos collecti; calyx masc. in alabastro globosus, subglaber; stamina numerosa, libera; ovarium dimerum, compressum, dense glanduloso-punctatum, transverse rugoso-plicatum, stylis 2 brevibus magnis dense papilloso-villosis terminatum ; capsulæ desiderantur.—Pegu, Martaban, Tenasserim (Helf. 4963).—Inter plantam meam et eam cl. Muell. Arg. ex descriptione discrimen nullum adest nisi ovarium dimerum, nec alato 3-gonum. Mallotus Wallichianus, Muell. Arg. ex Ava, a me non visa, nulla nota differe videtur. Hymenocardia, ovulis solitariis nec binis gaudens, a Coccocerate imprimis seminibus compressis et testæ textura differt. Numerus coccorum in Coccocerate variat 2-4 (et probabiliter usque 5).

264. CYCLOSTEMON EGLANDULOSUM (Hopea eglandulosa, Roxb. Fl. Ind. II. 611).

Arbor mediocris, 40—50-pedalis, glabra; folia subobliqua, ovato-oblonga v. ovato-lanceolata, basi acuta v. obtusa, petiolo 2—3 lin. longo gracili suffulta, integra, obtusiuscule acuminata, 1½—2 poll. longa, tenui-coriacea, eleganter reticulata, glabra; flores masculi glabri, feminci puberuli, c. 3 lin. in diametro, pedicello puberulo c. ½ pollicari suffulti, solitarii v. raro biui et axillares; ovarium fulvo-velutino-pubescens, 2-loculare; stigmata sessilia glabra, dilatato-3-angularia, crenata; drupæ desunt.—Arracan (etiam in montibus Bengaliæ orientalis).

265. Cyclostemon subsessile, nov. sp.

Arbuscula 25—30-pedalis, glabra; folia oblonga ad elliptico-oblonga, basi subinæqualia, obtusiuscule et sæpius subabrupte acumināta, 4—6 poll. longa, chartacea, integra v. undulata v. obsolete crenata, glabra, laxe reticulata; flores parvi, pedicello vix ½ lin. longo canescenti-pubescente suffulti, glomerati, axillares, calycis lobi concavo-orbiculares, extus canescenti-pubescentes, lineam circiter longi; drupæ ovoideo-oblongæ, obsolete 4-lobæ, c. ½—½ poll. longæ, pedunculo usque ad 1 lin. longo suffultæ, aurantiacæ, dense fulvo-puberulæ, 2-loculares et 2-spermæ, stigmatibus 2 v. raro 3 obtusius-culis minutis sessilibus coronatæ.—Martaban (etiam in montibus Khasyanis).

266. HEMICYCLIA ANDAMANICA, Kurz in And. Rep. 1870, p. 47.

Arbor 40—50-pedalis, glabra; folia ovato-oblonga v. oblongo-lanceolata, basi rotundata inæqualia, petiolo parce pubescente glabrescente 2—3 lin. longo suffulta, caudato-acuminata, obsolete repando-serrata, rigidiuscule chartacea,

8-3½ poll. longa, eleganter reticulata, glabra; flores majusculi, pedicello minute appresse-hirsuto 1-1½ lin. longo suffulti, solitarii v. bini, axillares: calyx appresse puberulus, lobis concavo-rotundatis, 2 interioribus tenuioribus c. 2 lin. longis; stamina numerosa; drupæ pedunculo vulgo deflexo crasso 2-3 lin. longo, obverse ovoideæ, plus quam semipollicem longæ, teretes, læves, putamine semiterete, tenui-coriaceo.—Andamans. (Helfer 4962, mas).

267. BRIEDELIA AMENA, Wall. ap. Voigt. Hort. Calc. 157.

Arbuscula 15—25-pedalis, glabra; folia elliptica ad obovato-elliptica, petiolo lævi 2 lin. longo, basi obtusa, $2\frac{1}{4}$ —4 poll. longa, obtusa v. rotundata tenui-chartacea, glabra, subtus subglaucescentia, nervis lateralibus et reticulatione exiguis; flores glabri, masculi flavescentes, multo minores, feminei brevi-pedicellati, dense glomerati, rubri, axillares; calyx fem. glaber, lobis lanceolatis subulato-acuminatis, lin. fere longis: petala minuta, obovato—oblonga, rocea; discus orbicularis, sublobatus; drupæ globosæ, pisi magnitudine, succulentæ, atropurpureæ, læves.—Burma. Genus Briedelia a Lebidieropside differt coccis inter se non connatis et seminum testa membranacea sicca. Drupa in Lebidieropside epicarpio carnoso gaudet, cocci lignosi connati et semina tegumento exteriori succoso-carnoso circumdata sunt.

268. BRIEDELIA PUBESCENS, nov. sp.

Arbusculæ 20—30-pedalis, novellis pubescentibus; folia elliptico-ad obovato-oblonga, basi rotundata v. obtusa, petiolo c. 2 lin longo pubescente, breviter et abrupte acuminata v. apiculata, tenui-chartacea, integra, supra glabra v. subglabra, subtus fulvescenti-pubescentia; flores parvi, albi, pedicello brevi pubescente suffulti, glomerati, axillares; calyx dense puberulus, lobis lanceolatis c. 1 lin. longis, petala obovata, truncata et 3-denticulata, discus magnus, orbicularis, aureus; drupæ desunt.—Pegu.—Habitus omnino B. Moonii, Thw.

269. Briedelia dasycalyx, nov. sp.

Frutex magnus scandens, novellis fulvo-pubescentibus; folia obovata ad obovato-oblonga, basi obtusa, petiolo crassiusculo c. 2 lin. longo suffulta, breviter acuminata apiculata v. obtusiuscula, 2—6 poll. longa, obsolete repanda, chartacea, supra glabrescentia, subtus subglaucescentia et parce pubescentia, nervis venisque valde prominentibus; flores parvi, fulvo-tomentella, sessiles, numerosi, in glomeros densos tomentosos axillares collecti et sæpius in racemum terminalem reducto-foliatum transformati; calyx extus dense fulvo-pubescens, c. 2 lin. in diametro, lobis sub fructu lin. longis lanceolatis acutis; discus orbicularis, lævis, in centro annulo setoso drupæ basin cingente auctus; petala obovato-linearia; drupæ ovoideo-ellipticæ, pisi magnitudine, læves, atropurpureæ, succulentæ, calyce non accrescente suffultæ. Var. a. genuina, frutex scandens, folia multo majora et texturæ tenuioris, acuminata. Var. \(\beta\). aridicola, frutex minor et erectus, folia minora, usque

ad 3 poll. longa et subcoriacea, obtusiuscula v. obtusa—Var. a. Ava, Prome, Pegu; var. β. Prome.—Ex affinitate B. stipularis, Bl.

270. CLEISTANTHUS STENOPHYLLUS, nov. sp.

Arbor v. frutex? glaber; folia lineari-lanceolata, basi acuta, petiolo 2 lin. longo, longe subulato-acuminata, 3—4 poll. longa, chartacea, integra, glabra subtus subpallida; flores minuti sessiles, pauci glomerati, axillares; bractez ciliato; calyx extus parce appresse pubescens; ovarium glabrum, sessile; capsulæ desunt.—Tenasserim v. Andamans (Helf. 4875).—N. B. Nanopetalum, Hassk. ad Cleistanthum certissime reducendum est.

271. CROTON ROBUSTUS, nov. sp.

Arbuscula robusta, 15—25-pedalis, novellis dense ferrugineo-lepidotis; folia elliptica v. elliptico-oblonga, petiolo crasso ferrugineo-lepidoto usque pollicem longo suffulta, basi biglandulosa obtusa v. acuta, 1½—2 poll. longa, obtusa v. obtusiuscula cun v. absque mucrone, raro subretusa, coriacea, obsolete repanda v. integra, subtus parce ferrugineo v. lutescenti-lepidota et glabrescentia, nervis lateralibus tenuibus vix conspicuis; flores parvi, masculi brevi-pedicellati canescenti-villoso-lepidoti, feminei subsessiles, majores ferrugineo-lepidoti racemos breviores spiciformes formantes, rachi canescenti-v. ferrugineo-tomentoso-lepidota et sulcata; calyx tomentoso-lepidotus; styli 2-fidi; ovarium dense cupreo-lepidotum; capsulæ globoso-ovoideæ, 3-coccæ, 6-sulcatæ, pisi majoris magnitudine, fulvo-argenteæ, obsolete lepidoto-tuberculatæ; semina 3 lin. fere længa, 3-angulari-oblonga, lævia, brunnea.—Pogu, Tenasserim.—Ex affinitate C. argyrati, Bl. (syn. C. bicolor, Roxb.).

272. CROTON CALOCOCCUS, nov. sp.

Fruticulus stellato-hirsutulus; folia elliptico-ovata v. ovata, basi biglandulosâ rotundata, petiolo gracili 3—4-lin. longo stellato-aspero suffulta, breviter acuminata, repando-serrulata, raro subintegra, 1—2 poll. longa, membranacea, flavescenti viridia, subtus stellato-pubescentia, supra stellato-aspera; bracteæ minutæ, subulatæ, hirsutæ; flores graciliter pedicellati, racemos graciles pubescentes terminales formantes; calyx hispidus, lokis sub fructu c. 1½ lin. longis lanceolatis; capsulæ pisi magnitudine, profunde et subdivaricato 3-lobæ et 3-coccæ, tuberculis pilis hispidis radiantibus terminatis obtectæ; semina lævia, brunnea.—Pegu, Rangoon.—Species elegans, C. Tiglii habitu, nulli arcte affinis.

273. CROTON FLOCCULOSUS nov. sp.

Arbuscula, novellis dense sed fugaciter albo- v. flavescenti-stellato-tomentosis; folia cordato-ovata, basi biglandulosa 5-nervia cordata v. rotundata, 1½—3 poll. longa et fere æquilata, obtusiuscule et subabrupte acuminata v. apiculata, crenata v. crenato-serrata (in serraturis glandulosa v. eglandulosa), membranacea, juniora subtus dense stellato floccosa, dein utrinque v. supra tantum glabrescentia; flores.....pedicellati, in racemos terminales dispositi; eapsulæ nutantes, pisi magni magnitudine, subglobosæ et obsolete 8-angula-

res, crustacez, dense et molliter canescenti-stellato-tomentosz; semina c. 2 lin. longa, elliptico-oblonga, dorso convexo lævia.—Pegu, Prome.—O. caudato affinis.

274. CROTON SUBLYRATUS, nov. sp.

Frutex deciduus, 5—8-pedalis, novellis ferrugineo-furfuraceis; folia obovato-ad sublyrato-oblonga, basi stipitato-biglandulosâ attenuatâ rotundata v. subcordata, petiolo 1—3 pollicari stellato-furfuraceo suffulta, obtusa v. obtusiuscule acuminata, 3—5-poll. longa, argute repando-serrulata, membranacea, adulta glabra v. subtus secus nervos stellato-aspera: flores parvi, pedicellati, stellato-tomentosa, racemum ferrugineo- v. fulvo-stellato-tomentosum ramulos novellos terminantem formantes; sepala lato-lanceolata, acuta, extus fulvo-pubescentia; petala marginibus ciliato-pubescentia; torus pilosus; stamina c. 15—20, glabra; petala in fl. fem. nulla; ovarium dense fulvo-stellato-tomentosum, stigmatibus brevibus; capsulæ parvæ, pisi minoris magnitudine, 3-coccæ, subglobosæ, crustaceæ, læves, parce appresse-stellato-hirtæ; semina 2 lin. fere longa, albido- et brunneo-variegata, lævia.—Andamans.—C. Tiglio quodammodo affinis.

275. CROTON CROZOPHOROIDES, nov. sp.

Suffrutex erectus, 1-11-pedalis, dense stellato-tomentosus; folia ovalioblonga v. ovalia, basi stipitato-biglandulosa rotundata v. obtusa, petiolo 1-11 pollicari stellato-tomentoso subglabrescente suffulta, obtusa v. acuta, 1\—2 poll longa, indistincte dentato-crenata (denticulis pilis stellatis terminatis), crasse membranacea, juniora dense canescenti-stellato-tomentosa, supra granulato-aspera et subtus tomentella, nervis et reticulatione crassis et prominentibus; flores lutescentes, parvi, masculi pedicello 1-2 lin. longo (feminei brevi crasso) stellato-tomento-o suffulti, racemos longos stellatopubescentes ramulos novellos axillares terminantes formantes; bracteæ conspicuæ, 2-3 lin. longæ, linearcs, stellato-pubescentes et muriculis coccineoglandulosis ciliatæ, calyx extus dense fulvo-stellato-tomentosus, femineus major, lobis laficcolatis acutis; petala maris oblongo-lanceolata, marginibus albo-villosis; stamina numerosa, glabra, toro piloso inserta; ovarium dense fulvo-stellato-tomentosum, stylis coccineis, bis dichotomice-divisis; capsulæ ovoidco-globosæ, leviter 3-lobæ, 3-coccæ, cerasi putaminis magnitudine. apice depresso, fulvo-stellato-tomentose, crustacee. - Species pulcherrima distinctissima, habitu omnino Julocrotonis.-Prome.

276. CŒLODISCUS HIRSUTULUS, nov. sp.

Suffrutex 1—2-pedalis, simplex, ramulis junioribus compressis hirsutis; folia opposita, suborbicularia, 5—6 poll. longa et subæquilata, basi 7-nerviå subobsolete maculatà cordata, petiolo ½—1 ped. fere longo pubescente suffulta, brevissime et obtusiuscule acuminata, subintegra v. obsolete repandodentata, chartacea, utrinque sparse sed longe hispida, subtus prominenter et crasse nervosa, glabrescentia et parce aureo-glandulosa; spicæ masculæ densæ

et breves, usque } pollicares, sessiles, fulvo-tomentellæ, axillares; bracteæ sublineares, calyce paulo longiores; calyx maris plusquam lin. in diametro, fulvo-tomentellus, in alabastro globosus; sepala 3, lato concavo-ovata; stamina numerosissima, glabra; flores feminei et capsulæ ignotæ.—Pegu, Prome.—Cœlodiscus melius species omnes Malloti includit quæ alabastro apiculato et seminibus carunculatis gaudent. Genus tali modo reformatum, characteribus stabilibus ornatum, magis naturale evadit, et inter alia Mallotum eriocarpoidem, eriocarpum, lappaceum, longipedem et disparem recipit.

277. CLAOXYLON LONGIPETIOLATUM, nov. sp.

Frutex subsimplex v. arbuscul¹, 8—15-pedalis, caulibus fistulosis et novellis appresse pubescentibus, folia elliptica ad ovato-oblonga, basi acuta v. obtusa, v. raro subcordata, petiolo 5—3 poll. longo suffulta, breviter et tenuiter acuminata, 4—8 poll. longa, crasse membranacea, undulato-crenata v. crenato-dentata, penninervia, utrinque scabra, subtus secus nervos parce appresse pubescentia; flores parvi, masculi racemos nutantes canescentes appresse hispidos formantes; capsula (unica tantum adest in montibus Khasya a cl. Hookero et Thomsonio collecta et a speciminibus ipsis separata) iis Malloti eriocarpoidi nimis affinis, profunde 3-loba, muricibus hirsutis obtecta, stylis simplicibus papilloso-fimbriatis coronata, 3-cocca, coccis pisi magnitudine.—Pegu, Martaban.—C. longifolio affinis.

278. CLAOXYLON LEUCOCARPUM, nov. sp.

Fruticulus 3—4-pedalis, caulibus fistulosis, novellis stellato-pubescentibus; folia ampla, lato-ovata, basi rotundata v. subcordata, petiolo puberulo glabrescente 3—8 pollicari suffulta, pedem circiter longo et fere æquilata, basi crasse-3- v. sub-5-nervia, breviter et obtusiuscule acuminata, repandodentata, membranacea, supra stellato-aspera, subtus stellato-puberula, nervis venisque transversis crassis et prominentibus percursa; flores desunt, feminei breviter-pedicellati, racemos breves stellato-tomentosos axillares efformantes; calyx stellato-tomentosus, inæquali-2-sepalus; ovarium dense muricatum, stellato-hispidum; capsulæ pedunculo puberulo 2—3 lin. longo crasso suffultæ, cerasi minoris magnitudine, 3-v. raro 4-v. 2-coccæ et -lobæ, stylis crassis papilloso-fimbriatis coronatæ, dense muricati (muricibus stellato-hispidis), albæ, carnoso-coriaceæ; semina subgloboso-ovoidea, lævia, pisi minoris magnitudine, arillo niveo succulento omnino inclusa.—Pegu.

279. TRAGIA BURMANICA, nov. sp.

Frutex volubilis, novellis appresse puberulis; folia larga, cordato-ovata, petiolo 1—3 pollicari canescenti-appresse-puberulo suffulta, basi 5-nervia sinuato-cordata, breviter et abrupte acuminata, tenui-chartacea, remoto denticulata v. subintegra, 2—5 poll. longa, supra sparse albo-setulosa, flores desunt; pedunculi solitarii, graciles, 2—3 poll. longi, puberuli, e ramulis novellis axillaribus egredientes; calycis lobi sub fructu lato-ovati, foliacei, acuti, pollicem fere longi, extus sparsius, intus dense appresse setosi; capsulæ 8-

coccæ, coccis pisi majoris magnitudine, longe et rigide appresse hirsutæ, lignosæ, calyce aucto 6-foliolato sustentæ; semina globosa, velutim, pulcherrime atrobrunneo-tigrinæ.—Martaban.

Blumeodendron nov. g.

Flores dioici. Calyx maris valvatus, 3-partitus. Petala nulla. Discus maris glandiformis. Stamina numerosa, libera, receptaculo centrali elevato inserta. Ovarii rudimentum nullum. Ovarium 3-loculare, ovulis solitaris. Capsula magna, fibroso-carnoso, 3-cocca. Semina magna, arillo spurio crasso involuta. Albumen saponaceum. Cotyledones foliacei, suborbiculares; radicula brevis.—Arbores, foliis oppositis et utplurimum verticillatis, simplicibus, petiolis incrassato-articulatis. Flores mediocres, pedicellati, breviter racemosi, racemis fasciculatis axillaribus.

Genus a cl Muell. Arg. cum Malloto incaute conjunctum.

280. Blumeodendron Tokbrai, (Mallotus Tokbrai, Muell. Arg. in DC. Prod. XV/2 956.) Etiam in insulis Andamanicis occurrit.

Altera species, sub nomine Paracrotonis penduli in Horto Bogoriensi culta et sub eodem nomine a cl. Muell. Arg. in Prodromo annotata, nomine Bl. Muelleri saluto. Folia sunt minora, texturæ tenuioris et subtus lævia.

—Paracroton pendulus, Miq, mihi ignota est, sed jam racemis 3—4½-pedalibus capsulisque tomentosis toto culo differt.

N. B. Mallotus albus, Muell. Arg. = M. tetracoccus (Rottlera tetracocca, Roxb. H. Ind. III. 826.)—Rottlera alba, Roxb. cum Malloto paniculato, Muell. Arg. conjungenda est.

281. CLEIDION NITIDUM, Thw. MS.

Arbuscula glaberrima; folia lato- ad elliptico-lanceolata, petiolo 2—3 lin. longo (in speciminibus Ceylonicis longiore) crasso suffulta, utrinque acuminata, a medio repando-dentata, 2—3½ poll. longa, tenui-coriacea, glabra, in sicco fuscescentia; flores masculi parvi, glabri, sessiles, pauci, glomerati, spicam glabram v. indistincte puberulam elongatam oppositifoliam terminalem efficientes; calyx glaber, in alabastro globosus; flores aperti etc. ignoti.—Andamans.

282. MACARANGA MOLLIUSCULA, nov. sp.

Arbor mediocris, novellis molli-pubescentibus; stipulæ magnæ, linearioblongæ, acuminatæ; folia magis minusve orbiculari-ovata, petiolo 3—4
pollicari glabrescente glaucescente suffulta, basi multinerviâ lato-cordata,
½—1; ped. in diametro, sinuato-denticulata, breviter acuminata, membranacea
v. submembranacea, supra molli-puberula v. subglabra, subtus dense puberula
et luteo-glandulosa, raro glabrescentia; flores parvi, masculi et feminei sessiles, illi glomerati bracteâ foliaceâ 2—4 lin. longâ lato-ovali v. ovatâ acuminatâ dentatâ v. pectinatâ protecti et paniculam axillarem pedunculatam
subgracilem puberulam efficientes; feminei solitarii bracteâ cuneato-oblongâ

sæpius 3-lobá serrato-dentatâ v. fimbriatâ foliaceâ tomentellâ c. $\frac{1}{4}$ — $\frac{3}{4}$ pollicari subtenti, spicas simplices interruptas puberulas formantes; antheræ 5—6; ovarium appresse hispidulum, 2-loculare; styli 2, subulati; capsulæ desunt. Andamans (Helf. 4722).—

N. B. M. gummiflua, Muell. Arg. = M. denticulata, Muell. Arg.

283. MACARANGA MEMBRANACEA, nov. sp.

Frutex sursum ramosus, 2—4-pedalis, novellis puberulis, ramulis glabrescentibus et glaucescenti-fuscis; folia ovata v. suboblongo-ovata, non peltata, basi 3-nerviâ subtruncata v. subsinuato-rotundata, petiolo gracili 1—3 poll. longo puberulo suffulta, 2—4 poll. longa, simplicia w passim in lobos 2 v. 1 laterales longe acuminatos producta, remote calloso-dentata, longissime et tenuiter acuminata, juniora utrinque rubescenti-glandulosa et subvelutina, v. supra glabrescentia; flores masculi, ignoti, feminci sessiles, solitarii bini v. terni, bracteâ foliaceâ ½—¾ pollicari ovatâ acuminatà lacerato-dentatâ puberulâ et glandulosâ subtenti et in capitulum involucratum pedunculo 1—3 poll. longo pubescente axillari suffultum collecti; calyx urceolatus, limbo tubulari styli basin amplectente, ovarium rubicundo-glandulosum et hirsutum, styli 2, ½ poll. longi, filiformes, glabri; capsulæ 2-coccæ et 2-lobæ, coccis pisi minoris magnitudine, rubicundo-glanduloso-pulverulentæ et muricibus filiformibus glabris sparsis obtectæ; semina globosa, brunnea, lævia.—Ava, Martaban.—M. involucratæ affinis.

284. Codieum Andamanicum, nov. sp.

Frutex magnus, glaber; folia obovato-oblonga ad elliptica, basi acuta v. obtusa, petiolo 3—10 lin. longo, breviter et obtusiuscule acuminata, 3—6 poll. longa, pergamacea, integra, glabra; flores parvi, masculi pedicello capillari 3—4 lin. longo suffulti et racemum umbelli- v. corymbi-formem formantes, feminei paulo majores, p-dicello brevissimo crasso supportati et corymbulum subsessilem ramulos novellos sepius axillares terminantem efficientes; calycis lobi rotundati, glabri, ii fl. fem. ovati, acuti; petala in mare parva; glandulæ hypogynæ magnæ, trigono-truncatæ, carnosæ; stamina in seriebus pluribus; ovarium apprese hirsutum, stylis 3 longissimis profunde bifidis, capsulæ pedunculo nutante brevi sursum incrassato suffultæ, globoso-3-coccæ, cerasi minoris magnitudine, indistincte scabriusculæ, ligno-so-coriaceæ; semina ovoideo-elliptica, holosericeo-canescentia, variegata.—Andamans.— O. umbellato, Muell. Arg. affinis.

285. Codizum? Lutescens, nov. sp.

Frutex dioicus?, 8—12-pedalis, novellis sparse puberulis; folia lanceolata, passim subfalcata, basi acuminata, petiolo 2—3 lin. longo puberulo glabrescente suffulta, obtusiuscule acuminata, pergamacea, glabra, penninervia, in sicco flavescentia; flores masculi minuti, pedicello capillari 2—3 lin. longo suffulti, umbellati, umbellis pedunculo puberulo $\frac{1}{3}$ — $\frac{1}{4}$ pollicari apice capitato-bracteato solitario axillari suffultis; calyx 3-partitus, leviter imbricatus, lobis ovato-lanceolatis, c. ½ lin. longis, acutis, extus appresse hispidulis; stamina c. 8—12 circa centrum læve luteum disci latiusculi continui inserta petala nulla; flores feminci etc. ignoti.—Andamans.

286. EXCECARIA HOLOPHYLLA, nov. sp.

Arbor sempervirens, glaberrima; folia alterna, oblonga ad lato-lanceo-lata, basi acuta v. obtusa, petiolo 3—4 lin. longo suffulta, obtusiuscule acuminata, pergamacea, integerrima, 3—6 poll. longa, nervis lateralibus curvis tenuibus; flores parvi, sessiles, masculi 3-ni v. plures, feminei basilares solitarii, bracteis brevibus latis (magnæ glandulæ utrinque insertis) protecti et racemum spiciformem oppositifolium terminalem glabrum formantes; flores masculi 2—3-andri; baceæ ignotæ—Martaban, Tenasserim—E. oppositifoliæ affinis, sed foliis integerrimis alternis statim distinguenda.

287. EUPHORBIA SCABRIFOLIA, nov. sp.

Herba annua, subsimplex, gracilis, 1—2-pedalis, ramis glabris in sieco sulcatis; stipulao breves et angustæ, parce et rigide fimbriatæ; folia linearia v. elongato-lineari-oblonga, brevissime petiolata v. subsessilia, basi inæquali rotundata v. obtusa, 1—2 poll. longa, mueronato-acuta, cartilagineo-serrulata, erasse membranacea, supra glabra, subtus sparse crispato-pilosula, 1-nervià, nervis lateralibus nullis, glauco-viridia; capitula subsessilia, in cymas glomeriformes subsessiles axillares v. spurie terminales collecti, v. sæpe bina v. solitaria; involucrum campanulatum, breve, extus puberulum, fauce villosum, fimbriatum, glandulis in appendicem obovato-cuneatum laceratum album plus quam lin. longum expansis; ovarium canescenti-pilosulum; styli graciles, 2-lobulati; capsulæ 3-cocæ, parce crispato-pilosulæ, c. 2-lin. in diametro, coccis compresso-acutis dorso nudis; semina obsolete 3-gono-oblonga, sordide aurantiaca, opaca, lævia.—Prome, Pegu.—Ex affinitate E. notopteræ, Boiss.

288. EUPHORBIA EPIPHYLLOIDES, Kurz in And. Rep. ed 2. 48.

Arbuscula 15—12-pedalis, carnosa, glabra, inermis, ramis complanatis crasse alatis, crenato-sinuatis, ad articulationes attenuatis et teretibus; stipulæ obsoletæ; folia obovalia, brevissime petiolata, basi obtusa, glabra, carnosa, nitentia, rotundata v. subretusa, nervis lateralibus obsoletis; capitula in cymulas dichotomas brevipedunculatas glabras e sinubus crenaturarum ramorum egredientes disposita; capsulæ profunde trilobæ, glabræ, iis E. ligulariæ consimilia.—Andamans.

URTICACE A.

BALANOSTREBLUS, nov. gen. Pl. XIX.

Flores monoici; masculi ignoti (ex inflorescentiis valde juvenilibus propabiliter amentacei?). Feminei racemosi: perianthium cum ovario connatum, sufsum liberum et ovarium omnino includens, apice perforatum.s Ovarium semisuperum, 1-ovulatum, ovulo pendulo; stylus perbrevis, e perianthii orificio protrudens; stigmata 2, brevia, crassa, villosula. Drupa perianthio carnoso inclusa, monosperma. Arbor lactescens, subglabra, foliis alternis grosse spinescenti-dentatis. Genus imperfecte cognitum sed distinctissimum *Antiari* affine

289. BALANOSTREBLUS ILICIFOLIUS, nov. sp.

Arbor ramulis scabriuscule puberulis; folia elliptica ad lato-ovalia, petiolo terete 1—2 lin. longo glabro suffulta, basi sæpius subinæquali acuta v. obtusa, rigide coriacea, spinoso-acuta, grosse spinoso-dentata, 1—3 poll. longa, glabra, supra nitida costa supra immersa subtus unacum nervis lateralibus arcuato anastomosantibus valde prominente; flores parvi, viridiusculi, pedicello brevi crasso suffulti, in racemum axillarem brevem collecti; perianthium obturbinatum, rugulose-tuberculatum, c. 2 lin. longum; drupæ pisi minoris magnitudine, rubræ, rugulosæ, carnosæ, glabræ.—Chittagong (Hf. et Th. sub Sapii sp. No. 4); Ava (J. Anderson).

MUSACEÆ.

290. MUSA RUBRA, Wall. ap. Voigt Cat. Hort. Calc. 579, non hort.; Kurz in Journ. Agr. Hort. Soc. Beng. XIV. 301.

Humilis, cæspitosa, caudicibus pollicem vix crassis viridibus; folia oblonga basi subrotundata glabra, petiolis brevibus foliaceo-marginatis; spathæ saltem apice imbricatæ deciduæ ovales obtusæ rubræ pruinosuko 5—6-floræ; flores aurantiaci, labio pumilo; fructus crasse truncato-rostrati lutei glabri; senina depresso-turbinata lævia.—Pequ, Martaban.

LILIACEÆ.

291. DRACÆNA HELFERIANA, Wall. MS. (Cordyline Helferiana, T. And. Cat. Hort. Calc. 72.)

Suffrutex parvus, decumbens, simplex v. vix ramosus, glaber, 1—2-pedalis, caudice basi radicante 3—4 lin. crasso; folia approximata, obverse lanceolato-oblonga, sessilia et basi dilatata, v. in petiolum lato-foliaceum longiorem v. breviorem vaginantem subattenuata, acuta v. breviter acuminata, 1—1½ ped. longa et 1½—2 poll. lata, subundulata, tenui-coriacea, costa apicem versus subevanescente, venis in sieco tenuibus sed prominentibus; flores albi v. in colorem purpurascentem vergentes, tubo viridiusculo, poll. longi, pedicello gracili basin versus articulato suffulti 2—3-ni fasciculati, secundi et paniculam parce divaricato-ramosam terminalem amplam glabram efficientes; bracteæ lineari-lanceolatæ, eæ ramificationum inferiorum usque ad pollicem longæ, deciduæ; bracteolæ ovato-lanceolatæ, minutæ; perianthium basi inflatum et fere usque ad basin 6-partitum, lobis linearibus obtusis tubuloso-convergentibus apice tantum patentibus; filamenta alba; baccæ 1—3 lobæ, lobis subsphæricis pisi magnitudinis aurantiacis nitidis 1-spermis.

—Pequ. Martaban, Tenasserim.—D. ternifoliæ affinis,

292. Dracæna pachyphylla, nov. sp.

Fruticulus crectus v. ascendens, simplex v. vix ramosus, glaber, 1—2-pedalis, caulibus digiti minoris crassitudine v. tenuioribus; folia elliptica ad elliptico-lanceolata, acuta v. subulato-acuminata, coriacea, sæpius maculata, 4—6 poll. longa et 1½—2½ poll. lata, costa apicem versus evanescente, venis tenuibus et prominentibus, superiora basi sensim complicato-attenuata semi-amplexicaulia, inferiora in petiolum usque ad poll. longum foliaceum basi vaginanter ampliatum abruptius contracta; flores albi, pedicello brevissimo robustiusculo articulato suffulti, racemum terminalem 1—2 pollicarem spici-formem pedunculatum glabrum efficientes; perianthium c. ¾ poll. longum rectum, basi parum inflatum, fere usque ad basin 6-fidum, lobis erectis et tubiformi-conniventibus apice tantum erecto-patentibus; baccæ 3—1-lobæ, lobis globosis pisi magnitudine rubris nitentibus monospermis.—Andamans. (etiam Malacca, Maingay No. 1684). A D. spicata, specie arborea, quacum cl. Baker conjunxit, statura humili et perianthio recto non torto jam differt. D. Finlaysoni, Baker, cadem est ac D. linearifolia, Miq.

293. Dracæna brachyphylla, nev. sp.

Fruticulus gracilis, parce ramosus, glaber caulibus 2—4 lin. crassis, folia linearia, sessilia basi breve petioliformi-attenuata et lato-amplexicaulia; ½—1-pedalia, acuminata, tenui-chartacea, costà apicem versus evanescente venisque tenuissimis et prominentibus; flores ½—3 poll. longi, albi, pedicello supra medio articulato 2—3 lin. longo suffulti, bini v. solitarii, in racemos breves strictiusculos dispositi et paniculam terminalem sessilem brevem erectam glabram formantes; bracteæ lineari-lanecolatæ, subulato-acuminatæ, inferiores usque ad ½ poll. longæ; bracteolæ ovatæ, acutæ, membranaceæ, scarioso-marginatæ, c. lin. longæ; perianthium fere ad basin 6-fidæ, lobis tubuloso-conniventibus et apice erecto-patentibus; filamenta alba; baccæ.—Andamans.—D. angustifoliæ affinis.

GRAMINEÆ.

294. ARUNDINARIA ELEGANS, nov. sp.

Fruticosa, 6—15-pedalis, culmis digit-crassis; folia linearia, longe acuminata, brevissime petiolata, rigide chartacea, 4—5 poll. longa, ½—½ poll. lata, subtus conspicue tesselata et, præsertim apicem versus, secus margines cartilagineas subspinuloso-scabra; foliorum vaginæ glabræ, ore truncato paree hirsuto; turionum vaginæ parce fulvo-hispidulæ, ore nudo attenuato minute auriculatæ; spiculæ pedicello gracili ½—1 poll. longo suffultæ, 1½—½ poll. longæ, 14—4-floræ, racemum terminalem paniculiformem angustum glabrum efficientes; glumæ 2, 3—3½ lin. longæ, superior paulo brevior; rachillæ c. 2 lin. longæ, sericeo-puberulæ, nodo barbatæ; valvula exterior c. 4 lin. longa, compresso-concava, lanceolata, cuspidato-acuminata, lævis; valvula interior paulum brevior compresso-navicularis, secus carinas apicem versus

appresse-albido puberulis; turionum vagimo magnæ, appresse argente-osetulosæ, ore subtruncatæ; lamina imperfecta extus appresse sericeo-setulosa, basi in aurieulas falcato-oblongas setoso-fimbriatas decurrens; folia lineari-lanceolata, basi truncata sæpius subobliqua, breviter (1 lin.) petiolata (superiora u bsessilia), 4—8 poll. longa, ½—1 poll. lata, acuminata, subtus scabride hirtula, marginibus scabra, nervis utrinque 5—7; vagimæ glabræ? (verosimiliter juniores hirsutæ), ore haud productæ et auricula incrassata longe (pilis 2—4 lin. longis) fimbriata terminatæ; spiculæ, etc. ignota.—Pegu.— ex affinitate B. strictæ.

298. (MUANTOCHLOA (OXYTENANTHERA) MACROSTACHYA, nov. sp.

Arborea, 30-50-pedalis, caspitosa, culmis brach, crassis; turionum vagina brevissima, 5-8 poll. longro, dense appresse nigrescenti-setosæ; lamina imperfecta in auriculas magnas undulatas rotundato-terminatas fuscofimbriatas decurrens; lingula angustissima, integra v. obsolete dentata; folia lanccolata, basi obtusa v. subrotundata, breviter (1 lin.) petiolata, 5-7 poll. longa, 3-1 poll. lata v. latiora, acuminatissima, marginibus retrorse scabra, subtus albida et molliter puberula ; vaginæ patenti-hirsutæ, glabrescentes, uno latere oris paulum producti minute auriculatæ et parce sed longe (2-3 lin.) timbriatae; lingula inconspicua; spiculæ sessiles (raro una alterave pedunculata), 14-2 poll. longæ, lineares, compressiusculæ, 6-7-floræ. stricta v. raro curvulæ, subulato-acuminatæ, laxe glomeratæ, interrupto spicatæ et sensim paniculam amplam radicalem efficientes; valvulæ exteriores omnes rigide nigrescenti-fimbriata, inferiores 3 v. I abbreviata et vacua, superiores 3 hermaphroditæ; valvula exterior fl. herm. lineari-lanceolata, convoluta, subulato-acuminata; valvula interior anguste navicularis, præsertim sursum secus angulos dorsi deplanati atropurpurco-ciliata, apice vix bilida ; antheræ purpureæ, aristato-acuminatæ ; ovarium cum stylo simplici longo hirsutum; stigma album.—Martaban, Tenasserim.—Genus Oxytenanthera, Munro (excepta O. Thwaitesii) nulla nota differt a Gigantochloa nisi caryopside elongata; valvula interior in omnibus speciebus a me examinatis deplanata et bicarinata evadit. Gigantochloæ genus valde artificiale et filamentis connatis vix ac ne vix a Bambust differt. Habitus et spicularum structura in generibus Bambusa et Gigantochloa simili modo variat et species ex habitu arctissime affines, e. g. B. polymorpha et Gigantochloa aspera spiculis omnino inter se different.

299. MELOCANNA HUMILIS, nov. sp.

Fruticosa, cespitosa, S—15-20 pedalis, oulmis \(\frac{1}{4}\)—1 poll. crassis; turionum vagime glabrie? brevissime, ore sinuato valde producto rotundates et ampliate; lamina imperfecta linearis, erecta, basi in marginem polito-viridem angustum decurrens; lingula angustissima, integra; folia lanceolata ad lineari-lanceolata, basi obtusa, petiolo 2—3 lin. longo suffulta, subulato-acuminata, 4—6 poll. longa \(\frac{1}{4}\)—1 poll. lata, secus marginem alterum scaberrima

subtus glaucescentia et scabrido-puberula; vaginæ glabræ, ore minute auriculato longe fimbriatæ; spiculæ, etc. ignota.—*Pegu, Arracan. Melocanna* a *Schizostachyo* differt caryopsidis epicarpio crasse carnoso et perigynii absentiâ.

. 300. CEPHALOSTACHYUM FLAVESCENS, nov. sp.

Fruticosa, cæspitosa, 10-15-pedalis, culmis poll. circiter crassis; turionum vaginæ fragiles, appresse albo-setulosæ, lamina imperfecta erecta v. subcrecta, inflato-cordata, convoluto-acuminata, basi in appendices latas undulatas fimbriatas falcatas decurrens, quarum una deflexa altera sursum vergens; lingula c. 2 lin. lata, erosodentata; folia parva, linearia, 3-5 poll. longa, 1 poll. lata, acuminata, basi rotundata, brevissime petiolata marginibus præsertim apicem versus scabra, cæterum glabra; vaginæ glabræ, ore vix producto minute et incrassato-auriculateo et pauci-fimbriatco; spiculæ cylindrico-lineares, acuminatae, c. 1 poll. longae, albo-pilosæ, 3-floræ, dense glomeratæ et interrupte spicatæ, dein sensim in paniculam radicalem amplam collectæ; valvula infima vacua, sequentes hermaphroditæ cum terminali hebetata; valvula interior et exterior fl. herm. subconformis, albopilosa, subulato-acuminata, illa dorso subdeplanato apicem pilosum versus bicarinata; lodiculæ 3, lanceolatæ, acuminatæ, ciliolatæ; antherac primum viridiusculæ et purpurascenti-punctatæ, dein pallide flavæ, acutæ v. obtusæ; perigynium elongato-lageniforme, cum rostro triquetro parce pilosum; stigmata 3, brevia, albo-pilosa; pericarpium.....- Pegu, in H. B. C. culta.-C. pergracili affine. - Genus Teinostachyum a Cephalostachyo more Arthrostulidii rachillis elongatis tantum differt et, in opinione mea, rejiciendum est. Schizostachyum Blumci Munro, non N. E. species est nova Hindostanica, Sch. Hindostanicum nominanda.

301. PSEUDOSTACHYUM COMPACTIFLORUM, nov. sp.

Arborea, cæspitosa, semiscandens, culmis 1—1½ poll. crassis; turionum vaginæ lævissimæ, lamina imperfecta in auriculam augustam reflexam lunato-productam patenter fimbriatam decurrens, lingula integra, angustissima; folia larga, oblongo-lanceolata ad lanceolata, basi oblique truncata v. obtusa, breviter (1—2 lin.) petiolata, 6—10 poll. longa, 1—2 poll. lata, subulato-acuminata, glabra, uno latere apicem versus scabra; vaginæ appresse sericeo-setosæ, mox glabrescentes, ore truncato in auriculam lunatam reflexam longo (3 lin.) fimbriatam productæ, ligula integra, angusta; spiculæ minimæ, 2—2½ lin. tantum longæ, iis Bambusæ longispathæ consimiles, latæ et sub anthesi quasi truncato-2-lidæ, 5-floræ, dense glomeratæ et interruptespicatæ, dein sensim in paniculam amplam radicalem collectæ; valvulæ inferiores 2 vacuæ, sequentes 2 hermaphroditæ, cum flosculo terminali longæ pedicellato obovato; valvulæ exterior fl. herm. lato-ovalis, ventricæ;a, brevissime mucronata, nitens, c. 2 lin. longa; valvula interior æquilonga, latonavicularis, apice 2-denticulata, secus angulos dorsi depressi albo-ciliata;

lodiculæ 3, maximæ, ovales, obtusæ, longe fimbriatæ; antheræ virescentilutæ, perigynium cum rostro brevi truncato glabrum; stigmata brevia, albo-plumosa; pericarpium maturum pomi feri magnitudinis, irregulariglobosum, nitens, rigide coriaceum; semen maximum, carnosum, mox germinans.—Martaban,

302. Pseudostachtum Helferi, nov. sp. (Bambusa Helferi, Munto,?)

Subscandens, exspitosa, arborescens, culmis poll. circiter crassis; turionum vaginæ fugacissime albido-setulosæ, lamina imperfecta patens, basi attenuata in auriculam parvam longe fimbriatam producta, lingula angustissima setis albis 2—1 lin. longis fimbriata; folia larga, oblongo-lanceolata, basi vulgo inequalia, bréviter (1—2 lin.) petiolata, acuminata, ½—1 ped. longa 2—2½-3 poll. lata, juniora secus margines scabra, mox glabra, subtus glaucescentia; vaginæ apparenter glabræ, ore parum producto et uno latere minute fimbriato-auriculatæ; lingula fimbriata, fragilitate pilorum mox integra v. indistincte denticulata; spiculæ, etc. ignota.—Pegu, Martaban.

303. DINOCHLOA ANDAMANICA, nov. sp.

Alte scandens, culmis poll. circiter crassis; turionum vaginæ sparse albido-setulose, ore nudo rotundata et vulgo undulata; lamina imperfecta erecto-patens, supra hispidula, lingula minute denticulata, sinum oris maiginans; folia larga, oblongo-lanceolata ad lanceolata, basi rotundata, brevissime petiolata, setacco-acuminata, 6-12 poll. longa, 1-2 poll. lata, utrinque lævia; vaginæ glabræ, ore parum producto subrotundatæ, lingula angusta, albida, os totum marginans et integra; spiculæ minutæ, 1-1 lin. longæ, ovatæ, nitidæ, stramineæ, glabræ, sessiles, glomeratæ, interrupte spicate et in paniculam racemiformem angustam terminalem collectæ; valvula inferior saccato-cymbiformis, abbreviata, retuso-mucronata, vacua; valvula exterior fl. herm. lato-convoluto-ovata, acuta, lævis, lin. fere longa; valvula interior conformis; autheræ spurie-1-loculares, acuminatæ; ovarium etc., ignota. . Andamans (etiam in insulis Nicobaricis) .- D. Tjangkorreh affinis, sed spiculis multo minoribus pallidis (nec brunneis) foliis multo majoribus et ligula vaginarum differt. Specimina ex insulis Phillipinis, valvula interiore ciliata gaudentia et a cl. Munro cum D. Tjangkorreh conjuncta mihi est species nova et etsi eam non vidi D. ciliatam nomino.

804. DINOCHLOA MACLELLANDII, (Bambusa Maclellandii, Munro in Linn, Trans, XXVI. 114).

Alte scandens, culmis pollicem crassis; turionum vaginæ fugaciter appresse argenteo-sctulosæ ore incrassato polito-marginatæ; ligula brevis, integra; folia magna, oblongo- ad ovato-lanceolata, basi rotundata, breviter (1—2 lift.) petiolata, subulato-acuminata, ½—1½ ped. longa, 1½—3½ polllata, lævia, uno latere apicem versus retrorse scabra; vaginæ juniores appresse argenteo-setulosæ, mox glabrescentes, ore parum productæ et auricu-

la appressa rotundata nitente nuda terminatæ, lingula os totum occupans, integra; spiculæ, etc. ignota.—*Pegu, Martaban*.

CORRIGENDA ET ADDENDA.

Pueraria brachycarpa, supra p. 232, dele observationem "Spatholobus crassifolius Bth. Diocless est species," et adde:

243b. PUERARIA STRICTA, nov. sp.

Herba perennis erecta 2—1-pedalis, ramis subterctibus novellis canescenti-tomentosis; folia pinnatim 3-foliolata, petiolo 1½—2 pollicari pubescente suffulta; foliola ovata, lateralia inaqualia, 2—3 poll. longa, acuta v. breviter acuminata chartacea utrinque sparse appresse hirsutula; flores desunt; racemi canescenti-tomentosi simplices axillares et in paniculas terminales collecti; bractere parvæ, subulatæ, persistentes; pedicelli sub fructu c. 2 lin. longi, calyx c. lin. longus puberulus; legumina lineari-oblonga, 1—1½ poll. longa, 2½ lin. lata, plana, glabra, pallida, 7—9-sperma; semina compresso-orbicularia, nigra, c. 2 lin. lata.—Pegu, Martaban.

243c. PCERARIA HIRSUTA, nov. sp.

Herba perennis volubilis v. prostrata ramis obtuse angulatis et retrorse appresse hirsutis; folia pinnatim 3-foliolata, petiolo patenter hirsuto 2—2½ pollicari suffulta; foliola ovata ad ovato-lanceolata, lateralia obliqua, acuminata, chartacea, 2½—3½ poll. longa, utrinque (præsertim subtus) sparse appresse hirsuta; flores desunt; racemi vulgo bini v. terni dense fulvo-hirsutuli, axillares; bracteæ deciduæ; pedicelli sub fructu c. lin. longi; calyx parvus; legumina oblongo-v. lineari-lanceolata, ½—1 poll. longa, 3—3½ lin. lata, plana et subtorosa, sparse sed longe et patenter hirsuta, 2—1-sperma; semina transverse ovoidea, compressa, pallida v. pallide brunnea, nitida, c. 2½ lin. lata.—Pegu.

Explanatio tabularum.

- T. XVIII. Gonocitrus angulatus, Kz. Fig. 1. ramus fructiferus; f. 2. fructus; f. 3. id. longitudinaliter sectus; f. 4. id. horizontaliter sectus; f. 5. semen, magnitudine paullo auctum; f. 6. semen longitudinaliter sectum.
- T. X1X. Balanostreblus ilicifolius, Kz. Fig. 1, ramus florens plantæ femineæ; f. 2. ramus fructicans; f. 3. racemus florum femineorum; f. 4. flos femineus perianthio remoto ovarium exhibens; f. 5. flos femineus longitudinaliter dissectus; f. 6 fructus maturi sectio verticalis. Fig. 3—6 omnes magnitudine auctæ.

Notes on the Certilina of India,—by W. E. Brooks, Esq., C. E., Dinapore.

(Received September 8th, read November 5th, 1873.)

With a good series of about thirty to work with, it appears to me that we have decidedly five species in India.

1 .- CERTHIA HIMALAYAVA, Vigors.

A well-known species which need not be described here, and which is distinguished from the others by its well-barred tail, the other species having the tail only occasionally obscurely rayed.

II.—CERTHIA HODGSONI, Brooks.

The differences between this bird and the European C. familiaris have been already pointed out.*

I regard the four outer plain or unspotted primaries of C. Hodgsoni versus the three plain ones of the English bird, as conclusive evidence of the distinctness of the two species. The much longer and straighter bill, with the white lower mandible; and the greyer and less rufous tone of plumage, with much whiter spotting on the back and head, should also be taken into account. The legs and feet of the English bird are also, as a rule, darker. The voices of the two birds differ; that of the English one being much londer and somewhat different in tone. The Indian species is much more silent. I have before noted the conspicuous difference in the eggs.

This species is the C. familiaris of some Indian ornithologists.

III .- CLRTHIA NIPALENSIS, Hodgson.

Certhia discolor, Blyth.

Any one who has examined Mr. Hodgson's drawing of C. Nipalensis, must have seen at a glance that it represents the earthy brown breasted bird; and L have therefore no hesitation in uniting both species under Hodgson's term.

The supposition that the brown-breasted bird could be identical with either of the two species next to be described, is a great mistake, as a good series at once shews. As far as my own observation goes, the sexes of the Certhiine are alike in plumage. Even the young and old are very similar. The earth-brown tint of C. Nipalensis commences from the base of the lower mandible; and the chin and throat, which are generally protected from getting soiled in most birds, are in this species as dark as any part of the breast. The idea that the brown lower surface is merely produced by the feathers being soiled, is against the rule with regard to Creepers, which preserve the purity of their plumage in a remarkable manner, even near large manufacturing towns. The colour on the breast of C. Nipalensis is, as Mr. Blyth observed, a fast colour.

^{*} Journ. A. S. Soc. Beng. Vol. XLI, Part II, p. 73.

The tail of this species is more rufous than that of any of the others. In other respects the colouration of the *upper* parts is similar to that of the two species next to be described. *C. Nipalensis* has a large and rather strong bill compared with those of the others.

Hab. Nepal and Sikkim.

IV.—CERTHIA SIOLICZKÆ, n. sp.

This species, as far as the upper surface is concerned, resembles C. Nipalensis, but the bill is much shorter and weaker. The chin and throat are fulvous, and breast warm buff, increasing in rufous tone to the flanks and lower tail coverts, which are bright rusty brown. The rump and upper tail coverts, as in C. Nipalensis, are bright rusty brown, even brighter perhaps than in that species; but the colour of the tail feathers is less rufous, particularly so as regards the shafts of the feathers. The long claws, especially those of the anterior toes, and the large foot, are noticeable in this new species; in fact, it could almost be separated by the foot alone. Sometimes its throat alone is nearly white, but from this point the fulvous tone covers the lower surface.

I have much pleasure in naming it after my friend Dr. Stoliczka, to whom Indian naturalists are so much indebted.

Hab Sikkim.

V.—CERTHIA MANDELLII, n. sp.*

A bird of similar dimensions to the last, but with a longer and more curved bill, and smaller feet and claws.

The throat and breast are bright silky white; abdomen and sides tinged with brown, and flanks slightly washed with rusty: lower tail coverts pale rusty brown; upper tail coverts, as in the last, bright rusty brown; tail plain brown with the shafts rather rusous. In the colour of the tail being less rusous, this bird differs much from the last. Its principal characteristics are, however, the pure white breast, instead of the buff one of the last species, while the upper surface of the bird is very similar.

One of the eight specimens differs notably from all the others, by having a warm rosy tinge suffusing the white of the breast and throat. I do not, however, think this sufficient ground upon which to make a new specific and will not, therefore, name it provisionally; but will leave this to any one who will take the trouble to investigate the creepers further than I have done The present species is named after Mr. Mandelli who sent me the two new species I have just described, and who placed all the creepers in his collection at my service.

Hab. Silskim.

In examining examples of this genus, care is necessary to keep the long loose feathers in their proper places. The rufous feathers of the rums often

* This species is probably the "Certhia Nipalensis" of Jerdon's Birds of India; as the "lower parts" of the last are not "pure white."